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Title of Invention: _____

Inventors (please provide full names): _____

_____

Earliest Priority Filing Date: _____

***For Sequence Searches Only* Please include all pertinent information (parent, child, divisional, or issued patent numbers) along with the appropriate serial number.**

Point of Contact:
Jan Delaval
Librarian-Physical Sciences
CM1 1E01 Tel: 308-4498

****

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Searcher: Jan
Searcher Phone #: 4498
Searcher Location: _____
Date Searcher Picked Up: 12/21
Date Completed: 1/2
Searcher Prep & Review Time: _____
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Type of Search

NA Sequence (#)_____
AA Sequence (#)_____
Structure (#) _____
Bibliographic ✓
Litigation _____
Fulltext _____
Patent Family _____
Other _____

Vendors and cost where applicable

STN ✓
Dialog _____
Questel/Orbit _____
Dr.Link _____
Lexis/Nexis _____
Sequence Systems _____
WWW/Internet _____
Other (specify)_____

PTO-1590 (8-01)

57120

Delaval, Jan

From: Ungar, Susan
Sent: Friday, December 21, 2001 9:52 AM
To: Chan, Christina
Cc: Delaval, Jan
Subject: Rush search for 09/999,202

Hi

I need a rush search for 08/888,292 for a review of pancreatic lipase. My STN is down and I need it ASAP.

Jan Delaval has agreed to do the search for me. Please send the authorization directly to her.

Thanks
Susan Ungar
1642
305-2181
CM1-8B05

Point of Contact:
Jan Delaval
Library - Biological Sciences
CM1 7E07 Tel: 308-4498

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DICTIONARY FILE UPDATES:  19 DEC 2001  HIGHEST RN 377047-34-2

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for more information.  See STNote 27, Searching Properties in the CAS
Registry File, for complete details:
http://www.cas.org/ONLINE/STN/STNOTES/stnotes27.pdf

=> d ide can l4

L4   ANSWER 1 OF 1  REGISTRY  COPYRIGHT 2001 ACS
RN   9001-62-1  REGISTRY
CN   Lipase, triacylglycerol (9CI)  (CA INDEX NAME)
OTHER NAMES:
CN   2212E
CN   Allzyme Lipase
CN   Amano AP
CN   Amano B
CN   Amano CE
CN   Amano CES
CN   Amano LPL 200S
CN   Amano M
CN   Amano N-AP
CN   Amano P
CN   Arthrobacter lipase
CN   Butyrinase
CN   C-Lipase
CN   Cacordase
CN   Capalase K
CN   Capalase L
CN   Chirazyme L
CN   Chirazyme L 1
CN   Chirazyme L 2
CN   Chirazyme L 2C2
CN   Chirazyme L 3
CN   Chirazyme L 5
CN   Chirazyme L 6
CN   Chirazyme L 9
CN   ChiroCLEC-CR
CN   ChiroCLEC-PC
CN   CloneZyme ESL 001
CN   DLIP 300
CN   E.C. 3.1.1.3
CN   Enzylon PF
CN   Fetipase
CN   GA 56
CN   GA 56 (enzyme)
CN   Glycerol ester hydrolase
CN   Hepatic lipase
CN   Hepatic triacylglycerol lipase
CN   IM 60
CN   Italase C
CN   KWI 56
```

Point of Contact:
Jan Delaval
Librarian-Physical Sciences
CM1 1E01 Tel: 308-4498

```
CN   Lilipase A 10
CN   Lilipase B 2
CN   LIP 300
CN   Lipase
CN   Lipase 250
CN   Lipase A
CN   Lipase AK
CN   Lipase AKG
CN   Lipase AL
CN   Lipase AP
CN   Lipase AP 6
ADDITIONAL NAMES NOT AVAILABLE IN THIS FORMAT - Use FCN, FIDE, or ALL for
     DISPLAY
AR   152923-53-0
DR   9001-70-1, 9004-01-7, 9014-49-7, 132823-04-2, 135105-44-1, 119663-46-6,
     142615-72-3, 211049-96-6, 211049-97-7, 211255-77-5, 212955-16-3
MF   Unspecified
CI   COM, MAN
LC   STN Files:   ADISNEWS, AGRICOLA, ANABSTR, BIOBUSINESS, BIOSIS, BIOTECHNO,
       CA, CABA, CAPLUS, CASREACT, CBNB, CEN, CHEMCATS, CHEMINFORMRX, CHEMLIST,
       CIN, CSCHEM, DDFU, DIOGENES, DRUGNL, DRUGU, DRUGUPDATES, EMBASE, IFICDB,
       IFIPAT, IFIUDB, IPA, MEDLINE, MRCK*, MSDS-OHS, NAPRALERT, NIOSHTIC,
       PIRA, PROMT, RTECS*, TOXCENTER, TOXLIT, ULIDAT, USAN, USPAT2, USPATFULL,
       VTB
         (*File contains numerically searchable property data)
     Other Sources:   DSL**, EINECS**, TSCA**, WHO
         (**Enter CHEMLIST File for up-to-date regulatory information)

*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***
           20294 REFERENCES IN FILE CA (1967 TO DATE)
             519 REFERENCES TO NON-SPECIFIC DERIVATIVES IN FILE CA
           20337 REFERENCES IN FILE CAPLUS (1967 TO DATE)

REFERENCE   1:  135:376140

REFERENCE   2:  135:373175

REFERENCE   3:  135:372966

REFERENCE   4:  135:372144

REFERENCE   5:  135:372043

REFERENCE   6:  135:371971

REFERENCE   7:  135:371786

REFERENCE   8:  135:371653

REFERENCE   9:  135:371572

REFERENCE  10:  135:371552


=> d his

     (FILE 'HOME' ENTERED AT 10:57:15 ON 21 DEC 2001)
               SET COST OFF

     FILE 'REGISTRY' ENTERED AT 10:57:29 ON 21 DEC 2001
               E PANCREATIC LIPASE/CN
               E LIPASE, PANCREA/CN

     FILE 'HCAPLUS' ENTERED AT 10:57:58 ON 21 DEC 2001
               E YVIN J/AU
L1           41 S E4-E5
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                E VETVICKA V/AU
L2            91 S E3-E5
L3          8113 S PANCREA?(L)?LIPASE?

     FILE 'REGISTRY' ENTERED AT 10:58:51 ON 21 DEC 2001
L4             1 S 9001-62-1

     FILE 'HCAPLUS' ENTERED AT 10:58:54 ON 21 DEC 2001
L5         20376 S L4
L6          3454 S L5 AND ?PANCREA?
                E PANCREAS/CT
                E E3+ALL
L7         42522 S E6+NT
                E E21+ALL
L8          2946 S E4+NT
                E E7+ALL
                E E22+ALL
L9         53828 S E4,E3+NT
                E E23+ALL
                E E23+ALL
L10        90838 S E4+NT
                E E18+ALL
                E E24+ALL
L11         1582 S E6+NT
                E E11+ALL
                E E25+ALL
L12          271 S E14,E13+NT
                E PANCREA/CW
L13        43247 S  E4,E5,E8,E11
                E LANGER
L14            1 S E6
L15            1 S E18
L16        17779 S E22-E36
L17           10 S E37-E40
L18         2300 S L5 AND L7-L17
L19         3163 S L3 AND L5
L20         8729 S L3,L6,L18,L19
L21            0 S L1,L2 AND L20
L22            3 S L1,L2 AND ?LIPASE?
L23            3 S L1,L2 AND L5
L24            3 S L22,L23
L25            0 S L1 AND L2
L26            1 S L1,L2 AND L7-L17
L27            0 S L1,L2 AND ?PANCREA?
L28            4 S L24,L26
L29          330 S L20 AND REVIEW/ST
L30          130 S L29 AND L5
L31           48 S L30 AND PANCREA?/CW
L32           60 S L30 AND PANCREA?/TI
L33           68 S L31,L32
L34           67 S L33 AND ?LIPASE?
L35           68 S L33,L34
L36           59 S L35 AND REVIEW(2A)(LIPASE OR PANCREA?)/ST
L37            9 S L35 NOT L36
L38           46 S L30 AND (LIPASE AND PANCREA?)/ST
L39           22 S L35 NOT L38
L40           68 S L35-L39

     FILE 'REGISTRY' ENTERED AT 11:09:46 ON 21 DEC 2001

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FILE LAST UPDATED: 20 Dec 2001 (20011220/ED)

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=> d l40 bib abs hitrn tot

L40 ANSWER 1 OF 68 HCAPLUS COPYRIGHT 2001 ACS
AN 2001:341064 HCAPLUS
DN 134:349750
TI **Pancreatic lipase**: physiological studies
AU Brockman, Howard
CS The Hormel Institute, University of Minnesota, Austin, MN, 55912, USA
SO Intest. Lipid Metab. (2001), 61-79. Editor(s): Mansbach, Charles M., II. Publisher: Kluwer Academic/Plenum Publishers, New York, N. Y.
CODEN: 69BHL6
DT Conference; General Review
LA English
AB A review, with 123 refs., on **pancreatic** triacylglycerol **lipase** (PTL) from the standpoint of its role in intestinal lipid hydrolysis and how PTL is able to carry out that role. Of necessity, it must also include **pancreatic colipase** because the understanding the interaction of this protein with lipids and PTL is essential to understanding how PTL overcomes the challenges to lipolysis in the intestinal lumen.
IT **9001-62-1, Lipase**
RL: BAC (Biological activity or effector, except adverse); BOC (Biological occurrence); BPR (Biological process); PRP (Properties); BIOL (Biological study); OCCU (Occurrence); PROC (Process)
(physiol. studies of **pancreatic lipase**)
RE.CNT 123
RE
(1) Abousalham, A; Protein Eng 1992, V5, P105 HCAPLUS
(3) Ayvazian, L; Protein Eng 1996, V9, P707 HCAPLUS
(4) Baskys, B; Arch Biochem Biophys 1963, V102, P201 HCAPLUS
(5) Bernard, C; Lipids 1996, V31, P261 HCAPLUS
(7) Borgstrom, B; Biochim Biophys Acta 1976, V450, P352 HCAPLUS
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L40 ANSWER 2 OF 68 HCAPLUS COPYRIGHT 2001 ACS
AN 2001:341063 HCAPLUS
DN 134:349749
TI Molecular mechanisms of **pancreatic lipase** and **colipase**

AU Lowe, Marke E.
CS Departments of Pediatrics and of Molecular Biology and Pharmacology, Washington University School of Medicine, St. Louis, MO, 63110, USA
SO Intest. Lipid Metab. (2001), 37-59. Editor(s): Mansbach, Charles M., II. Publisher: Kluwer Academic/Plenum Publishers, New York, N. Y.
CODEN: 69BHL6
DT Conference; General Review
LA English
AB A review, with 116 refs., on the **lipase** gene family, physiol., protein structure, tertiary structure, mol. mechanism of lipolysis, **colipase** and lipolysis, and the **colipase** gene.
IT **9001-62-1, Lipase**
RL: BAC (Biological activity or effector, except adverse); BOC (Biological occurrence); BPR (Biological process); PRP (Properties); BIOL (Biological study); OCCU (Occurrence); PROC (Process)
(mol. mechanisms of **pancreatic lipase** and **colipase**)
RE.CNT 115
RE
(1) Abousalham, A; Prot Engin 1992, V5, P105 HCAPLUS
(4) Andersson, L; Biochim Biophys Acta 1996, V1302, P236 HCAPLUS
(5) Arvan, P; J Biol Chem 1987, V262, P3886 HCAPLUS
(6) Arvan, P; J Cell Biol 1987, V104, P243 HCAPLUS
(7) Baskys, B; Arch Biochem Biophys 1963, V102, P201 HCAPLUS
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L40 ANSWER 3 OF 68 HCAPLUS COPYRIGHT 2001 ACS
AN 2000:892297 HCAPLUS
DN 134:143612
TI Kinetic behavior of the **pancreatic lipase-colipase**-lipid system
AU Brockman, H. L.
CS The Hormel Institute, University of Minnesota, Austin, MN, 55912, USA
SO Biochimie (2000), 82(11), 987-995
CODEN: BICMBE; ISSN: 0300-9084
PB Editions Scientifiques et Medicales Elsevier
DT Journal; General Review
LA English
AB A review with 74 refs. **Pancreatic lipase** is a surface-active protein that binds avidly to interfaces comprised of the substrates and products of lipolysis. However, both **lipase** binding to substrate-contg. particles and subsequent interfacial catalysis are inhibited by a no. of amphipathic mols. The most thoroughly studied of these, phosphatidylcholine, is a common constituent of membranes and intestinal lipid contents. **Colipase**, a surface-active cofactor of **lipase**, relieves inhibition by phosphatidylcholine in several ways. Through protein-protein interactions, **colipase** helps anchor **lipase** to surfaces and stabilizes it in the open conformation. Within the interface, **colipase** packs more efficiently with substrates and products of lipolysis than with phosphatidylcholine, thereby concg. these reactants in the vicinity of **colipase**. This enrichment of **lipase** substrates and products in the vicinity of **colipase** enhances **lipase** -lipid interactions. **Colipase** facilitates the adsorption of **lipase** to the interface and, possibly, increases the availability of substrate to the enzyme. Thus, the functional unit in intestinal lipolysis appears to be a **lipase-colipase**-reactant complex.
IT **9001-62-1, Lipase**
RL: BPR (Biological process); BIOL (Biological study); PROC (Process)
(kinetic behavior of the **pancreatic lipase-colipase**-lipid system)
RE.CNT 74
RE
(1) Abousalham, A; Protein Eng 1992, V5, P105 HCAPLUS
(3) Benzonana, G; Biochim Biophys Acta 1965, V105, P121 HCAPLUS

(4) Bernard, C; Lipids 1996, V31, P261 HCAPLUS
(5) Bezzine, S; Biochemistry 1998, V37, P11846 HCAPLUS
(6) Bezzine, S; Biochemistry 1999, V38, P5499 HCAPLUS
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L40 ANSWER 4 OF 68 HCAPLUS COPYRIGHT 2001 ACS
AN 2000:521269 HCAPLUS
DN 133:248692
TI The C-terminal domain of **pancreatic lipase**: functional and structural analogies with C2 domains
AU Chahinian, H.; Sias, B.; Carriere, F.
CS Laboratoire de Lipolyse Enzymatique du CNRS UPR 9025, Marseille, 13402, Fr.
SO Curr. Protein Pept. Sci. (2000), 1(1), 91-103
CODEN: CPPSCM; ISSN: 1389-2037
PB Bentham Science Publishers Ltd.
DT Journal; General Review
LA English
AB A review with 61 refs. The 3D structure of **pancreatic lipase** (PL) consists of two functional domains. The N-terminal domain belongs to the .alpha./.beta. hydrolase fold and contains the active site, which involves a catalytic triad analogous to that present in serine proteases. The .beta.-sandwich C-terminal domain of PL plays an important part in the binding process between the **lipase** and **colipase**, the specific PL cofactor. Recent structure-function studies have suggested that the PL C-terminal domain may have an extra role apart from that of binding **colipase**. This domain contains an exposed hydrophobic loop (.beta.5') which was found to be located on the same side as the hydrophobic loops surrounding the active site, and it may be involved in the lipid binding process. Indirect evidence for this new function of the PL C-terminal domain has been provided by studies with monoclonal antibodies directed against the .beta.5' loop. The catalytic activity of the PL-antibody complexes on water insol. substrates decreased drastically, whereas their esterase activity on a sol. substrate remained unchanged. During the last few years, a no. of protein structures (15-lipoxygenase, .alpha.-toxin from Clostridium perfringens) have been detd. that contain domains with close structural homologies with the .beta.-sandwich C-terminal domain of PL. Generally speaking, these domains show structural homologies with the C2 domains occurring in a wide range of proteins involved in signal transduction (e.g., phosphoinositide-specific **phospholipase** C, protein kinase C, cytosolic **phospholipase** A2), membrane traffic (e.g., synaptotagmin I, rabphilin) and membrane disruption (e.g., perforin). Here it is proposed to review the structure and function of the C2 domains, based on the recent 3D structures and improved sequence alignments.
IT **9001-62-1, Lipase**
RL: BAC (Biological activity or effector, except adverse); BPR (Biological process); PRP (Properties); BIOL (Biological study); PROC (Process)
(C-terminal domain of **pancreatic lipase** has functional and structural analogies with C2 domains)
RE.CNT 61
RE
(1) Awad, M; Mol Microbiol 1995, V15, P191 HCAPLUS
(2) Ball, A; Proc Natl Acad Sci USA 1999, V96, P6637 HCAPLUS
(3) Bateman, A; Curr Biol 1999, V9, PR588 HCAPLUS
(4) Bennett, M; Science 1992, V257, P255 HCAPLUS
(5) Bezzine, S; Biochemistry 1998, V37, P11846 HCAPLUS
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L40 ANSWER 5 OF 68 HCAPLUS COPYRIGHT 2001 ACS
AN 2000:382265 HCAPLUS
DN 133:161071
TI Covalent Inhibition of Digestive **Lipases** by Chiral Phosphonates
AU Cavalier, Jean-Francois; Buono, Gerard; Verger, Robert
CS ENSSPICAM, Marseille, F-13397, Fr.

SO Acc. Chem. Res. (2000), 33(9), 579-589
CODEN: ACHRE4; ISSN: 0001-4842
PB American Chemical Society
DT Journal; General Review
LA English
AB A review with 53 refs. Designing and synthesizing specific inhibitors is of fundamental value for understanding the mol. mechanisms involved in the interfacial adsorption step as well as the catalytic activity of **lipases**. The authors review and discuss results obtained mostly at their lab. concerning the covalent inhibition of human gastric and human **pancreatic lipases** by chiral phosphonates. Rather than presenting an exhaustive list of compds. tested so far with **lipases** of animal and microbial origin, we selected recent exptl. data illustrating well the specific problems encountered during the covalent inhibition of these digestive **lipases**.
IT **9001-62-1, Lipase**
RL: BPR (Biological process); BIOL (Biological study); PROC (Process)
(covalent inhibition of digestive **lipases** by chiral phosphonates)
RE.CNT 53
RE
(1) Aoubala, M; Biochemistry 1995, V34, P10786 HCAPLUS
(2) Berg, O; Biochemistry 1997, V36, P14512 HCAPLUS
(3) Bjorkling, F; Bioorg Med Chem 1994, V2, P697 HCAPLUS
(4) Carriere, F; Protein Eng 1994, V7, P563 HCAPLUS
(5) Cavalier, J; Chem Phys Lipids 1999, V100, P3 HCAPLUS
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L40 ANSWER 6 OF 68 HCAPLUS COPYRIGHT 2001 ACS
AN 2000:66375 HCAPLUS
DN 133:116808
TI Biochemical diagnosis of chronic relapsing **pancreatitis** (Review of literature)
AU Gubergryts, N. B.; Shtoda, L. A.; Linevskaya, K. Yu.; Cherevetskaya, E. Yu.; Lukashevich, G. M.; Zagorenko, Yu. A.; Kuryshko, O. A.; Ostroukhova, I. N.; Prokopenko, N. I.; Tishchenko, T. B.; Klimova, L. V.; Romankova, V. A.; Stanislavskaya, E. N.; Berko, E. M.; Kozhemyakin, S. V.
CS Dep. Vnutr. Bolezn. NO.1, Donetsk. Gos. Med. Univ., Donetsk, Russia
SO Klin. Lab. Diagn. (1999), (8), 3-10
CODEN: KLDIES; ISSN: 0869-2084
PB Meditsina
DT Journal; General Review
LA Russian
AB A review with 80 refs. The article summarizes state-of-the-art tests for the diagnosis of chronic relapsing **pancreatitis**. Methods include the detn. of various enzymes, e.g. peptidases, esterases, **lipases**, nucleotidases from blood and their correlation with the disease.
IT **9001-62-1, Lipase**, triacylglycerol
RL: ANT (Analyte); THU (Therapeutic use); ANST (Analytical study); BIOL (Biological study); USES (Uses)
(biochem. diagnosis of chronic relapsing **pancreatitis**)

L40 ANSWER 7 OF 68 HCAPLUS COPYRIGHT 2001 ACS
AN 1999:760322 HCAPLUS
DN 132:75167
TI **Colipase**: structure and interaction with **pancreatic lipase**
AU van Tilbeurgh, H.; Bezzine, S.; Cambillau, C.; Verger, R.; Carriere, F.
CS Architecture et Fonction des Macromolecules Biologiques, GBMA, CNRS-IFR1 UPR9039, Marseille, 13288, Fr.
SO Biochim. Biophys. Acta (1999), 1441(2-3), 173-184
CODEN: BBACAQ; ISSN: 0006-3002
PB Elsevier Science B.V.
DT Journal; General Review
LA English

AB A review with 52 refs. **Colipase** is a small protein cofactor required by **pancreatic lipase** for efficient dietary lipid hydrolysis. It binds to the C-terminal, noncatalytic domain of **lipase**, thereby stabilizing an active conformation and considerably increasing the overall hydrophobic binding site. Structural studies of the complex and of **colipase** alone have clearly revealed the functionality of its architecture. Interestingly, a structural analogy has recently been discovered between **colipase** and a domain in a developmental protein, based on sequence analogy and homol. modeling. Whether this structural analogy implies a common function (lipid interaction) remains to be clarified. Structural analogies have also been recognized between the **pancreatic lipase** C-terminal domain, the N-terminal domains of lipoxygenases, and the C-terminal domain of .alpha.-toxin. These noncatalytic domains in the latter enzymes are important for interaction with membranes. It has not been established if these domains are also involved in eventual protein cofactor binding as is the case for **pancreatic lipase**.

IT **9001-62-1, Lipase**
RL: BPR (Biological process); BIOL (Biological study); PROC (Process)
(structure and function of **colipase** and its interaction with **pancreatic lipase**)

RE.CNT 52

RE
(1) Aravind, L; Curr Biol 1998, V8, PR477 HCAPLUS
(2) Ayvazian, L; J Biol Chem 1998, V273, P33604 HCAPLUS
(4) Boisbouvier, J; J Mol Biol 1998, V283, P205 HCAPLUS
(5) Bourne, Y; J Mol Biol 1994, V238, P709 HCAPLUS
(6) Boyington, J; Science 1993, V260, P1482 HCAPLUS
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L40 ANSWER 8 OF 68 HCAPLUS COPYRIGHT 2001 ACS
AN 1999:222358 HCAPLUS
DN 130:257228
TI **Pancreatic lipase**-mediated drug delivery with glyceride pharmaceutical prodrugs
AU Scriba, Gerhard K. E.
CS Inst. Pharmazeutische Chem., Westfaelische Wilhelms-Univ., Muenster, D-48149, Germany
SO Pharm. Unserer Zeit (1999), 28(2), 87-94
CODEN: PHUZBI; ISSN: 0048-3664
PB Wiley-VCH Verlag GmbH
DT Journal; General Review
LA German
AB A review is given with 23 refs. on lipid conjugates as prodrugs for a better oral bioavailability of drugs with minor soly. Phenytoin lipid conjugates were investigated including in vitro, pharmacol., and pharmacokinetic expts. to study **pancreatic lipase** -mediated delivery with glyceride prodrugs.

IT **9001-62-1**
RL: BPR (Biological process); THU (Therapeutic use); BIOL (Biological study); PROC (Process); USES (Uses)
(**pancreas lipase**-mediated drug delivery with glyceride pharmaceutical prodrugs)

RE.CNT 23

RE
(1) Albert, A; Nature 1958, V182, P421 HCAPLUS
(2) Amidon, G; J Pharm Sci 1980, V69, P1363 HCAPLUS
(3) Amidon, G; J Pharm Sci 1983, V72, P943 HCAPLUS
(5) Caldwell, J; Biochem Soc Trans 1985, V13, P852 HCAPLUS
(6) Fears, R; Prog Lipid Res 1985, V24, P177 HCAPLUS
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L40 ANSWER 9 OF 68 HCAPLUS COPYRIGHT 2001 ACS
AN 1998:805784 HCAPLUS
DN 130:193384

TI Immunological characterization of digestive **lipases**
AU De Caro, Alain; Bezzine, Sofiane; Lopez, Veronique; Aoubala, Mustapha; Daniel, Cecile; Verger, Robert; Carriere, Frederic
CS Laboratoire de Lipolyse Enzymatique, CNRS, Marseille, Fr.
SO Methods Mol. Biol. (Totowa, N. J.) (1999), 109(Lipase and Phospholipase Protocols), 239-256
CODEN: MMBIED; ISSN: 1064-3745
PB Humana Press Inc.
DT Journal; General Review
LA English
AB A review with 29 refs. The prodn. and use of polyclonal and monoclonal antibodies against human gastric **lipase** (HGL) and human **pancreatic lipase** (HPL) as probes for epitope mapping are described. The development of two sensitive and specific ELISAs for measuring HGL and HPL, resp., in the duodenal contents where both enzymes are present is also discussed.
IT **9001-62-1, Lipase**
RL: ANT (Analyte); PRP (Properties); ANST (Analytical study)
(gastric and **pancreatic lipases**; immunol. characterization and detn. of digestive **lipases**)
RE.CNT 29
RE
(1) Ameis, D; Eur J Biochem 1994, V219, P905 HCAPLUS
(2) Anderson, R; J Biol Chem 1991, V266, P22479 HCAPLUS
(5) Aoubala, M; Biochim Biophys Acta 1993, V1169, P183 HCAPLUS
(6) Aoubala, M; J Biol Chem 1995, V270, P3932 HCAPLUS
(7) Bodmer, M; Biochim Biophys Acta 1987, V909, P237 HCAPLUS
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L40 ANSWER 10 OF 68 HCAPLUS COPYRIGHT 2001 ACS
AN 1998:708155 HCAPLUS
DN 130:135647
TI Structural basis for the substrate selectivity of **pancreatic lipases** and some related proteins
AU Carriere, Frederic; Withers-Martinez, Chrislaine; van Tilbeurgh, Herman; Roussel, Alain; Cambillau, Christian; Verger, Robert
CS CNRS-IFR1 UPR 9025, Laboratoire de Lipolyse Enzymatique, Marseille, 13402, Fr.
SO Biochim. Biophys. Acta (1998), 1376(3), 417-432
CODEN: BBACAQ; ISSN: 0006-3002
PB Elsevier Science B.V.
DT Journal; General Review
LA English
AB A review with 47 refs. The classical human **pancreatic lipase** (HPL), the guinea pig **pancreatic lipase** -related protein 2 (GPLRP2) and the **phospholipase** A1 from hornet venom (DolmI PLA1) illustrate three interesting steps in the mol. evolution of the **pancreatic lipase** gene family towards different substrate selectivities. Based on the known 3D structures of HPL and a GPLRP2 chimera, as well as the modeling of DolmI PLA1, the authors review here the structural features and the kinetic properties of these three enzymes for a better understanding of their structure-function relationships. HPL displays significant activity only on triglycerides, whereas GPLRP2 displays high **phospholipase** and **galactolipase** activities, together with a comparable **lipase** activity. GPLRP2 shows high structural homol. with HPL with the exception of the lid domain which is made of five amino acid residues (mini-lid) instead of 23 in HPL. The lid domain deletion in GPLRP2 allows the free access to the active site and reduces the steric hindrance towards large substrates, such as galactolipids. The role of the lid domain in substrate selectivity has been investigated by site-directed mutagenesis and the substitution of HPL and GPLRP2 lid domains. The addn. of a large-size lid domain in GPLRP2 increases the substrate selectivity for triglycerides by depressing the **phospholipase** activity. The **phospholipase** activity is, however, not induced in the case of the HPL mutant with GPLRP2 mini-lid.

Therefore, the presence of a full-length lid domain is not the unique structural feature explaining the absence of **phospholipase** activity in HPL. The 3D structure of the GPLRP2 chimera and the model of DolmI PLA1 reveal a higher hydrophilic/lipophilic balance (HLB) of the surface loops (.beta.5 loop, .beta.9 loop, lid domain) surrounding the active site, as compared to the homologous loops in HPL. This observation provides a potential explanation for the ability of GPLRP2 and DolmI PLA1 to hydrolyze polar lipids, such as phospholipids. In conclusion, the .beta.5 loop, the .beta.9 loop, and the lid domain play an essential role in substrate selectivity towards triglycerides, phospholipids and galactolipids.

IT **9001-62-1, Lipase**
RL: BAC (Biological activity or effector, except adverse); BIOL (Biological study)
(structural basis for substrate selectivity of **pancreatic lipases**, guinea pig **pancreatic lipase** -related protein 2, and hornet venom **phospholipase** A1 in relation to mol. evolution)

RE.CNT 47
RE
(1) Andersson, L; Biochim Biophys Acta 1996, V1302, P236 HCAPLUS
(3) Borgstrom, B; Biochim Biophys Acta 1971, V242, P509 HCAPLUS
(4) Borgstrom, B; Eur J Biochem 1971, V242, P509 HCAPLUS
(5) Bourne, Y; J Mol Biol 1994, V238, P709 HCAPLUS
(6) Bownes, M; J Lipid Res 1992, V33, P777 HCAPLUS
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L40 ANSWER 11 OF 68 HCAPLUS COPYRIGHT 2001 ACS
AN 1998:466894 HCAPLUS
DN 129:200878
TI Combined **lipase** deficiency (cld/cld) in mice affects differently post-translational processing of lipoprotein **lipase**, hepatic **lipase** and **pancreatic lipase**
AU Scow, Robert O.; Schultz, Charles J.; Park, Jin-Woo; Blanchette-Mackie, E. Joan
CS National Institute of Diabetes and Digestive and Kidney Diseases, Laboratory of Cellular and Developmental Biology, National Institutes of Health, Bethesda, MD, 20892, USA
SO Chem. Phys. Lipids (1998), 93(1-2), 149-155
CODEN: CPLIA4; ISSN: 0009-3084
PB Elsevier Science Ireland Ltd.
DT Journal; General Review
LA English
AB A review with 47 refs. Lipoprotein **lipase** (LPL) and hepatic **lipase** (HL), which act on plasma lipoproteins, belong to the same gene family as **pancreatic lipase**. LPL is synthesized in heart, muscle and adipose tissue, while HL is synthesized primarily in liver. LPL is also synthesized in liver of newborn rodents. The active form of LPL is a dimer, whereas that of HL has not been established. Combined **lipase** deficiency (CLD) is an autosomal recessive mutation (cld) in mice which impairs post-translational processing of LPL and HL. Cld/cld mice have very low LPL and HL activities (<5% of normal), yet normal **pancreatic lipase** activity. They develop massive hypertriglyceridemia and die within 3 days after birth. The CLD mutation allows synthesis, glycosylation and dimerization of LPL, but blocks activation and secretion of the **lipase**. Thus, dimerization per se does not result in prodn. of active LPL. Immunofluorescence studies showed that LPL is retained in endoplasmic reticulum (ER) in cld/cld cells. Translocation of Golgi components to ER by treatment with brefeldin A (BFA) enabled synthesis of active LPL in cultured cld/cld brown adipocytes. Thus, prodn. of inactive LPL in cld/cld cells results from inability of the cells to transport LPL from ER. The CLD mutation allows synthesis and glycosylation of HL, but blocks activation of the **lipase**. Immunofluorescence studies located HL mostly outside of cells in liver, liver cell cultures and incubated adrenal tissue of normal and cld/cld mice and mostly inside of cells in

liver cell cultures and adrenal tissues treated with monensin (to block secretion of protein). These findings demonstrate synthesis and secretion of HL by both liver and adrenal cells of normal and cld/cld mice. Thus, the CLD mutation allows secretion of inactive HL by liver and adrenals. However, it does not block synthesis or secretion of active **pancreatic lipase**. Our findings indicate that LPL, HL and **pancreatic lipase**, although closely related, are processed differently.

IT **9001-62-1**, Hepatic **lipase**
RL: BPR (Biological process); BIOL (Biological study); PROC (Process)
(combined **lipase** deficiency (cld/cld) in mice affects differently post-translational processing of lipoprotein **lipase**, hepatic **lipase** and **pancreatic lipase**)

L40 ANSWER 12 OF 68 HCAPLUS COPYRIGHT 2001 ACS
AN 1998:352390 HCAPLUS
DN 129:105781
TI Structure-function relationships of **pancreatic lipases**
AU Carriere, Frederic; Withers-Martinez, Chrislaine; Van Tilbeurgh, Herman; Roussel, Alain; Cambillau, Christian; Verger, Robert
CS Laboratoire Lipolyse Enzymatique, Marseille, F-13402, Fr.
SO Fett/Lipid (1998), 100(4/5), 96-102
CODEN: FELIFX
PB Wiley-VCH Verlag GmbH
DT Journal; General Review
LA English
AB A review with 39 refs. The classical human **pancreatic lipase** (HPL) and the guinea pig **pancreatic lipase**-related protein 2 (GPLRP2) illustrate interesting steps in the mol. evolution of the **pancreatic lipase** gene family toward different substrate selectivities. Based on the known 3-dimensional structures of HPL and a GPLRP2 chimera, the structural features and the kinetic properties of these 2 enzymes are reviewed for a better understanding of their structure-function relations. HPL displays a significant activity only on triglycerides, whereas GPLRP2 displays high **phospholipase** and **galactolipase** activities, together with a comparable triglyceride **lipase** activity. GPLRP2 shows a high structural homol. with HPL with the exception of the lid domain, which is made of 5 amino acid residues (mini-lid) instead of 23 in HPL. The lid domain deletion in GPLRP2 allows a free access to the active site and reduces the steric hindrance toward large substrates such as galactolipids. The role of the lid domain in substrate selectivity was investigated by site-directed mutagenesis and the substitution of HPL and GPLRP2 lid domains. The addn. of a large lid domain in GPLRP2 increases the substrate selectivity for triglycerides by depressing the **phospholipase** activity. However, the **phospholipase** activity is not restored in the case of the HPL mutant with GPLRP2 mini-lid. Therefore, the presence of a full-length lid domain is not the unique structural feature explaining the absence of **phospholipase** activity in HPL. The 3D structure of the GPLRP2 chimera reveals a higher hydrophilic/lipophilic balance (HLB) of the surface loops (.beta.5 loop, .beta.9 loop, lid domain) surrounding the active site, as compared to the homologous loops in HPL. This observation provides a tentative explanation for the ability of GPLRP2 to hydrolyze polar lipids such as phospholipids. Thus, the .beta.5 loop, the .beta.9 loop, and the lid domain play an essential role in substrate selectivity toward triglycerides, phospholipids, and galactolipids.

IT **9001-62-1, Lipase**
RL: BSU (Biological study, unclassified); PRP (Properties); BIOL (Biological study)
(structure-function relations of **pancreatic lipases**)

L40 ANSWER 13 OF 68 HCAPLUS COPYRIGHT 2001 ACS
AN 1998:121764 HCAPLUS
DN 128:190979

TI Biochemical indicators of acute **pancreatitis**
AU Kazmierczak, Steven C.
CS Department of Pathology, East Carolina University School of Medicine, Greenville, NC, USA
SO Pathol. Lab. Med. (1997), 2(Clinical Pathology of Pancreatic Disorders), 75-124
CODEN: PLMEFF
PB Humana Press Inc.
DT Journal; General Review
LA English
AB A review, with 199 refs., on the diagnostic utility of both the commonly used and more esoteric indicators of acute **pancreatitis**. The analytes most frequently employed for the diagnosis of acute **pancreatitis** include amylase and the **pancreatic** isoenzyme of amylase and **lipase**. The markers infrequently used, but that may provide good diagnostic and(or) prognostic information, include trypsin, **phospholipase** A, carboxypeptidase A, and **lipase** isoforms. Some key issues related to the correct interpretation of these tests in certain pathophysiol. states such as renal failure are discussed. In, addn., the utility of some of these studies in the investigation of the etiol. of an attack of acute **pancreatitis** is also reviewed.
IT **9001-62-1, Lipase**
RL: ANT (Analyte); THU (Therapeutic use); ANST (Analytical study); BIOL (Biological study); USES (Uses)
(biochem. indicators of acute **pancreatitis**)

L40 ANSWER 14 OF 68 HCAPLUS COPYRIGHT 2001 ACS
AN 1998:29879 HCAPLUS
DN 128:151221
TI Biochemical diagnosis of severity of acute hepatitis
AU Kitagawa, Motoji; Naruse, Satoru; Ishiguro, Hiroshi; Hayakawa, Tetsuo
CS Second Dep. Int. Med., Nagoya Univ. Sch. Med., Japan
SO Shindan to Chiryo (1997), 85(11), 1923-1928
CODEN: SHCHA8; ISSN: 0370-999X
PB Shindan to Chiryosha
DT Journal; General Review
LA Japanese
AB A review with 10 refs. on diagnosis of severity of acute hepatitis by detn. of blood **pancreatic** enzymes.
IT **9001-62-1, Lipase**
RL: ANT (Analyte); THU (Therapeutic use); ANST (Analytical study); BIOL (Biological study); USES (Uses)
(biochem. diagnosis of severity of acute hepatitis)

L40 ANSWER 15 OF 68 HCAPLUS COPYRIGHT 2001 ACS
AN 1997:712702 HCAPLUS
DN 128:11284
TI New **pancreatic lipases**: gene expression, protein secretion, and the newborn
AU Lowe, Mark E.
CS USA
SO Methods Enzymol. (1997), 284(Lipases, Part A), 285-297
CODEN: MENZAU; ISSN: 0076-6879
PB Academic
DT Journal; General Review
LA English
AB A review, with .apprx.30 refs., on the methods that have been applied to det. occurrence and functions of PLRP1 and PLRP2(**pancreatic lipase**-related proteins 1 and 2).
IT **9001-62-1P, Lipase**
RL: BAC (Biological activity or effector, except adverse); BOC (Biological occurrence); PRP (Properties); PUR (Purification or recovery); BIOL (Biological study); OCCU (Occurrence); PREP (Preparation)
(gene expression and protein secretion of)

L40 ANSWER 16 OF 68 HCAPLUS COPYRIGHT 2001 ACS
AN 1997:712648 HCAPLUS
DN 128:19882
TI Site-specific mutagenesis of human **pancreatic lipase**
AU Lowe, Mark E.
CS USA
SO Methods Enzymol. (1997), 284(Lipases, Part A), 157-170
CODEN: MENZAU; ISSN: 0076-6879
PB Academic
DT Journal; General Review
LA English
AB A review with 26 refs. Site-specific mutagenesis is a powerful technique that has provided useful insights into the function of human **pancreatic lipase**. It can provide information about residues that contribute to catalysis, that mediate conformational changes, that interact with interfaces, and that bind to **colipase**. Examples of these studies are presented to illustrate techniques, approaches, and the utility of site-specific mutagenesis in the study of **pancreatic lipase**.
IT **9001-62-1, Lipase**
RL: BPR (Biological process); PRP (Properties); BIOL (Biological study); PROC (Process)
(site-specific mutagenesis of human **pancreatic lipase**)

L40 ANSWER 17 OF 68 HCAPLUS COPYRIGHT 2001 ACS
AN 1997:712591 HCAPLUS
DN 128:19880
TI **Pancreatic lipases** and their complexes with **colipases** and inhibitors: crystallization and crystal packing
AU Cambillau, Christian; Bourne, Yves; Egloff, Marie Pierre; Martinez, Chrislaine; van Tilbeurgh, Herman
CS USA
SO Methods Enzymol. (1997), 284(Lipases, Part A), 107-119 2 plates
CODEN: MENZAU; ISSN: 0076-6879
PB Academic
DT Journal; General Review
LA English
AB A review with 27 refs. The crystn. and crystal structures of different **pancreatic lipases** and of their complexes with **colipases** and inhibitors is described and their crystal packing in light of the crystn. expts. is analyzed.
IT **9001-62-1, Lipase 9001-62-1D, Lipase**, complexes with **colipase** and inhibitors
RL: PRP (Properties)
(crystn., crystal structure, and crystal packing of **pancreatic lipases** and their complexes with **colipases** and inhibitors)

L40 ANSWER 18 OF 68 HCAPLUS COPYRIGHT 2001 ACS
AN 1997:703476 HCAPLUS
DN 128:11270
TI Determination of **pancreatic lipase**
AU Uji, Yoshinori; Okabe, Hiroaki
CS Fac. Med., Kumamoto Univ., Kumamoto, 860, Japan
SO Kensa to Gijutsu (1997), 25(10), 819-824
CODEN: KTGIDU; ISSN: 0301-2611
PB Igaku Shoin
DT Journal; General Review
LA Japanese
AB A review with 6 refs. on the reaction mechanism, structure, methods for detn., and clin. significance of **pancreatic lipase**.
IT **9001-62-1**
RL: ANT (Analyte); BSU (Biological study, unclassified); ANST (Analytical study); BIOL (Biological study)
(detn. of **pancreatic lipase**)

L40 ANSWER 19 OF 68 HCAPLUS COPYRIGHT 2001 ACS
AN 1997:497542 HCAPLUS
DN 127:189947
TI Molecular mechanisms of rat and human **pancreatic** triglyceride **lipases**
AU Lowe, Mark E.
CS Departments of Pediatrics and of Molecular Biology and Pharmacology, Washington Univ. Sch. Med., St. Louis, MO, 63110, USA
SO J. Nutr. (1997), 127(4), 549-557
CODEN: JONUAI; ISSN: 0022-3166
PB American Society for Nutritional Sciences
DT Journal; General Review
LA English
AB A review with 49 refs. Dietary fats affect health and disease. The assimilation of dietary fats into the body requires that they be digested by **lipases**. One **lipase**, **pancreatic** triglyceride **lipase**, is essential for the efficient digestion of dietary fats. **Pancreatic** triglyceride **lipase** is the archetype of the **lipase** gene family that includes two homologues of **pancreatic** triglyceride **lipases**, **pancreatic** **lipase**-related proteins 1 and 2. In recent years, important advances have been made in delineating the mechanisms of lipolysis. The cDNA sequences encoding **pancreatic** triglyceride **lipase** and the related proteins have been described. The tertiary structure of human **pancreatic** triglyceride **lipase** has been detd. alone and in a complex with **colipase**, a **pancreatic** protein required for **lipase** activity in the duodenum. This structural information has allowed the rational design of site-specific mutants of **pancreatic** triglyceride **lipase**. Together with the structural information, these mutants have greatly advanced our understanding of the mol. details governing lipolysis. This review describes these studies, which will eventually provide the background for the rational design of nutrition therapy in patients with **pancreatic** insufficiency and fat malabsorption.
IT **9001-62-1**, Triglyceride **lipase**
RL: BAC (Biological activity or effector, except adverse); BPR (Biological process); BIOL (Biological study); PROC (Process)
(mol. mechanisms of rat and human **pancreatic** triglyceride **lipases**)

L40 ANSWER 20 OF 68 HCAPLUS COPYRIGHT 2001 ACS
AN 1997:495554 HCAPLUS
DN 127:201766
TI Structure and function of **pancreatic** **lipase** and **colipase**
AU Lowe, Mark E.
CS Departments of Pediatrics and of Molecular Biology and Pharmacology, Washington University School of Medicine, St. Louis, MO, 63110, USA
SO Annu. Rev. Nutr. (1997), 17, 141-158
CODEN: ARNTD8; ISSN: 0199-9885
PB Annual Reviews
DT Journal; General Review
LA English
AB A review, with 74 refs. Dietary fats are essential for life and good health. Efficient absorption of dietary fats is dependent on the action of **pancreatic** triglyceride **lipase**. In the last few years, large advances have been made in describing the structure and lipolytic mechanism of human **pancreatic** triglyceride **lipase** and of **colipase**, another **pancreatic** protein that interacts with **pancreatic** triglyceride **lipase** and that is required for **lipase** activity in the duodenum. This review discusses the advances made in protein structure and in understanding the relationships of structure to function of **pancreatic** triglyceride **lipase** and **colipase**.
IT **9001-62-1**, Triglyceride **lipase**

RL: BAC (Biological activity or effector, except adverse); PRP (Properties); BIOL (Biological study)
(structure and function of **pancreatic lipase** and **colipase**)

L40 ANSWER 21 OF 68 HCAPLUS COPYRIGHT 2001 ACS
AN 1997:132340 HCAPLUS
DN 126:171086
TI Porcine **pancreatic lipase** (PPL). A versatile biocatalyst in organic synthesis
AU Hertweck, Christian; Boland, Wilhelm
CS Institut Organische Chemie Biochemie, Universitaet Bonn, Bonn, D-53121, Germany
SO J. Prakt. Chem./Chem.- Ztg. (1997), 339(2), 200-202
CODEN: JPCCEM; ISSN: 0941-1216
PB Barth
DT Journal; General Review
LA English
AB A brief review with 27 refs. covering stereoselective and peptide synthesis.
IT **9001-62-1**
RL: CAT (Catalyst use); USES (Uses)
(porcine **pancreatic lipase** as biocatalyst in org. synthesis)

L40 ANSWER 22 OF 68 HCAPLUS COPYRIGHT 2001 ACS
AN 1997:55286 HCAPLUS
DN 126:129899
TI Research progress of **pancreatic** encephalopathy
AU Qian, Zhuyin; Liu, Zunliang
CS Dep. General Surgery, First Affiliated Hosp., Nanjing Med. univ., Changsha, 2100929, Peop. Rep. China
SO Jiangsu Yiyao (1996), 22(8), 551-552
CODEN: CIYADX; ISSN: 0253-3685
PB Jiangsu Yiyao Bianjibu
DT Journal; General Review
LA Chinese
AB A review, with 28 refs., on the progression of research of **pancreatic** encephalopathy; covering the etiol., including the effect of **lipase** and **phospholipase** A, pathol. and clin. picture, diagnosis and management, and prognosis.
IT **9001-62-1, Lipase**
RL: BAC (Biological activity or effector, except adverse); BOC (Biological occurrence); BPR (Biological process); BIOL (Biological study); OCCU (Occurrence); PROC (Process)
(**lipase, phospholipase** A, pathol., diagnosis, management and prognosis of human **pancreatic** encephalopathy)

L40 ANSWER 23 OF 68 HCAPLUS COPYRIGHT 2001 ACS
AN 1996:539371 HCAPLUS
DN 125:191335
TI Intracellular transport of **pancreatic** enzymes
AU Cook, L. J.; Musa, O. A.; Case, R. M.
CS Sch. Biological Scis., Univ. Manchester, Machester, UK
SO Scand. J. Gastroenterol., Suppl. (1996), 31(219), 1-5
CODEN: SJGSB8; ISSN: 0085-5928
DT Journal; General Review
LA English
AB A review with 16 refs. Most **pancreatic** secretory proteins are packaged within the trans-Golgi network into zymogen granules, which are secreted in a regulated manner by exocytosis. However, others enter alternative, constitutive-like pathways directed toward both apical and basolateral membranes. The authors' in vitro studies suggest that secretion via the latter type of pathway, which may be responsible for the appearance of **pancreatic** enzymes in the circulation, can be increased by stimulation, esp. supramaximal stimulation. This may partly

explain the increased concn. of **pancreatic** enzymes in the circulation in the early stages of **pancreatitis**. The mechanisms by which secretory proteins are sorted into zymogen granules remain vague. However, dissipation of the normally acidic gradient across the trans-Golgi network in vitro (e.g., with NH4Cl) inhibits the process by which newly synthesized proteins reach zymogen granules. However, secretion via the constitutive-like pathways is apparently not increased under these conditions. Thus, although the acidic milieu of the trans-Golgi network plays a role a role in **pancreatic** protein sorting, it may not be the mechanism by which constitutive-like secretion of **pancreatic** enzymes is increased.

IT **9001-62-1, Lipase**
RL: BPR (Biological process); BIOL (Biological study); PROC (Process)
(intracellular transport of **pancreatic** enzymes)

L40 ANSWER 24 OF 68 HCAPLUS COPYRIGHT 2001 ACS
AN 1996:290415 HCAPLUS
DN 124:336218
TI **Pancreatic lipase** and cholesteryl ester hydrolase
AU Kajiyama, Goro
CS Sch. Med., Hiroshima Univ., Hiroshima, 734, Japan
SO Domyaku Koka (1996), (9), 485-491
CODEN: DOMKDM; ISSN: 0386-2682
DT Journal; General Review
LA Japanese
AB A review with 23 refs. on mol. structures, genes, physiol. properties, detn., and relation to arteriosclerosis of **pancreatic lipase** (EC 3.1.1.3) and cholesteryl ester hydrolase (EC 3.1.1.13).
IT **9001-62-1**
RL: ANT (Analyte); BAC (Biological activity or effector, except adverse); PRP (Properties); ANST (Analytical study); BIOL (Biological study)
(**pancreatic lipase** and cholesteryl ester hydrolase)

L40 ANSWER 25 OF 68 HCAPLUS COPYRIGHT 2001 ACS
AN 1996:81882 HCAPLUS
DN 124:139228
TI **Lipase** structures at the interface between chemistry and biochemistry
AU Carriere, F.; Verger, R.; Lookene, A.; Olivecrona, G.
CS Laboratoire de Lipolyse Enzymatique, CNRS, Marseille, F-13402, Fr.
SO EXS (1995), Volume Date 1995, 73, 3-26
CODEN: EXSEE7; ISSN: 1023-294X
DT Journal; General Review
LA English
AB A review with 96 refs. In this chapter the authors review recent mol. knowledge on two structurally related mammalian triglyceride **lipases** which have evolved from a common ancestral gene. The common property of the **lipase** family members is that they interact with non-polar substances. **Pancreatic lipase** hydrolyzes triglycerides in the small intestine in the presence of many dietary components, other digestive enzymes and high concns. of detergents (bile salts). Lipoprotein **lipase** acts at the vascular side of the blood vessels where it hydrolyzes triglycerides and some phospholipids of the circulating plasma lipoproteins. A third member of the gene family, hepatic **lipase**, is found in the liver of mammals. Also, this **lipase** is involved in lipoprotein metab. The three **lipases** are distantly related to some non-catalytic yolk proteins from Drosophila (Persson et al., 1989; Kirchgessner et al., 1989; Hide et al., 1992) and to a **phospholipase** A1 from hornet venom (Soldatova et al., 1993).
IT **9001-62-1, Lipase**
RL: BSU (Biological study, unclassified); PRP (Properties); BIOL (Biological study)
(**lipase** structures at the interface between chem. and biochem.)

L40 ANSWER 26 OF 68 HCAPLUS COPYRIGHT 2001 ACS
AN 1995:401809 HCAPLUS
DN 122:181454
TI Development of a specific assay for **pancreatic lipase** activity for diagnostic purposes
AU Ferard, Georges; Lessinger, Jean Marc; Arzoglou, Panteleimon; Visvikis, Atanase; Junge, Wolfgang
CS Faculte de Pharmacie, Universite Louis Pasteur de Strasbourg, Illkirch, F 67400, Fr.
SO NATO ASI Ser., Ser. A (1994), 266(Esterases, Lipases, and Phosopholipases), 179-82
CODEN: NALSDJ; ISSN: 0258-1213
DT Journal; General Review
LA English
AB A review with 14 refs. Comparison of contemporary assays for **lipase**, interassay agreement of routine methods, recommendations for a ref. method, and anal. specificity were discussed.
IT **9001-62-1, Lipase**
RL: ANT (Analyte); ANST (Analytical study)
(specific assay for **pancreatic lipase** activity for diagnostic purposes)

L40 ANSWER 27 OF 68 HCAPLUS COPYRIGHT 2001 ACS
AN 1995:401807 HCAPLUS
DN 122:181452
TI **Pancreatic lipase, colipase** and enterostatin - a lipolytic triad
AU Erlanson-Albertsson, Charlotte
CS Dpt Medical and Physiological Chemistry 4, Lund, S-221 00, Swed.
SO NATO ASI Ser., Ser. A (1994), 266(Esterases, Lipases, and Phosopholipases), 159-68
CODEN: NALSDJ; ISSN: 0258-1213
DT Journal; General Review
LA English
AB A review with 44 refs. on some properties of **pancreatic lipase** and **colipase** and the more recently discovered peptide enterostatin acting as a feed-back signal for regulation of fat intake.
IT **9001-62-1, Lipase**
RL: BAC (Biological activity or effector, except adverse); BIOL (Biological study)
(**pancreatic lipase, colipase** and enterostatin in relation to lipolysis)

L40 ANSWER 28 OF 68 HCAPLUS COPYRIGHT 2001 ACS
AN 1995:34318 HCAPLUS
DN 122:75142
TI Titrimetric assay of **pancreatic lipase**: state-of-the-art.
AU Arzoglou, P
CS Dep. Chim., Univ. Aristotle-de-Thessalonique, Thessalonique, 540 06, Greece
SO Ann. Biol. Clin. (1994), 52(3), 165-70
CODEN: ABCLAI; ISSN: 0003-3898
DT Journal; General Review
LA French
AB A review, with 18 refs. Most **lipase** routine assays are carried out using either sol. substrates or emulsified substrates (triglycerides or olive oil) at low concns. Many of these techniques require a secondary std., which must be titrated beforehand; the need for a ref. method is thus compelling. Titrimetric assays have several advantages such as the possibility of employing high substrate concns. allowing the direct detn. of the product of lipolysis in the absence of interfering phenomena. In a recent study it was demonstrated that human **lipase** activity depends on the zeta-potential of the lipid droplets, the no. of hydroxy groups present in each individual bile salt, the aggregation no. and the

conjugation of bile salts with taurine or glycine. Hydroxypropyl methylcellulose proposed by Tietz et al is to be preferred to gum arabic for being a pure, well defined emulsifier. Ultrasonic homogenizers enable vols. of oil-in-water emulsions, characterized by fine lipid droplets with good homogeneity to be obtained without overheating. Lipolytic activity is completely inhibited by 70 mmol/L of bile salt (regardless of the type) in the absence of **colipase**. Variable concns. of **colipase** are needed to restore the **lipase** activity in the presence of different bile salts : optimal cofactor concns. vary from 0.1 mg/L with deoxycholate or cholate to 6 mg/L with taurocholate or glycocholate. Even after optimization of the medium with **colipase** , marked differences in enzyme activity are noted depending on the bile salt used. The addn. of calcium chloride at optimal concns., which vary according to the bile salt present, (e.g. 8.5 mmol/L in the presence of glycocholate, 12 mmol/L in the presence of taurocholate and 0.5 mmol/L in the presence of deoxycholate) leads to closer values of **lipase** activity. The combination of cofactors which ensures maximal enzyme activity is deoxycholate 70 mmol/L, **colipase** at 0.1 mg/L and calcium chloride 0.5 mmol/L. Significant progress has been made during the last years as regards the standardization of **lipase** assays. Therefore, the development of a ref. method appears to be a rather realistic goal today.

IT **9001-62-1, Lipase**
RL: ANT (Analyte); BAC (Biological activity or effector, except adverse); PRP (Properties); ANST (Analytical study); BIOL (Biological study)
(titrimetric assay of **pancreatic lipase**)

L40 ANSWER 29 OF 68 HCAPLUS COPYRIGHT 2001 ACS
AN 1994:695599 HCAPLUS
DN 121:295599
TI Structure and mechanism of human **pancreatic lipase**
AU Winkler, Fritz K.; Gubernator, Klaus
CS Pharma Research-New Technologies, F. Hoffmann-La Roche Ltd., Basel, 4002, Switz.
SO Lipases (1994), 139-57. Editor(s): Woolley, Paul; Petersen, Steffen B. Publisher: Cambridge Univ. Press, Cambridge, UK.
CODEN: 60HHAW
DT Conference; General Review
LA English
AB A review, with 48 refs., presenting the current understanding of the hydrolytic mechanism of **pancreatic lipase** and addressing some of the open questions with regard to interfacial activation and substrate recognition.
IT **9001-62-1, Lipase**
RL: BAC (Biological activity or effector, except adverse); BPR (Biological process); PRP (Properties); BIOL (Biological study); PROC (Process)
(structure and mechanism of human **pancreatic lipase**)

L40 ANSWER 30 OF 68 HCAPLUS COPYRIGHT 2001 ACS
AN 1994:654900 HCAPLUS
DN 121:254900
TI Application of pig **pancreatic lipase** to the preparation of synthetic chiral building blocks
AU Zhou, Aixin
CS Sch. Pharm., West China Univ. Med. Sci., Chengdu, 610044, Peop. Rep. China
SO Huaxi Yaoxue Zazhi (1994), 9(2), 104-6
CODEN: HYZAE2
DT Journal; General Review
LA Chinese
AB A review with 20 refs. on application of pig **pancreatic lipase** to the prepn. of synthetic chiral building blocks via esters hydrolysis, esterification, and condensation reactions.
IT **9001-62-1, Lipase**
RL: CAT (Catalyst use); USES (Uses)
(pig **pancreatic**; application of pig **pancreatic**

lipase to the prepn. of synthetic chiral building blocks)

L40 ANSWER 31 OF 68 HCAPLUS COPYRIGHT 2001 ACS
AN 1994:102943 HCAPLUS
DN 120:102943
TI Fate of **pancreatic** enzymes in the human intestinal lumen in health and **pancreatic** insufficiency
AU Layer, P.; Groeger, G.
CS Dep. Med., Univ. Essen, Essen, D-W-430011, Germany
SO Digestion (1993), 54(Suppl. 2), 10-4
CODEN: DIGEBW; ISSN: 0012-2823
DT Journal; General Review
LA English
AB The activities of **pancreatic** enzymes decrease during their passage from the duodenum to the terminal ileum, but degrdn. rates of individual enzymes are different. Whereas **lipase** activity is lost most rapidly, proteases and amylase are more stable. The mechanism by which **lipase** activity is destroyed is proteolysis, mainly by the action of chymotrypsin. This mechanism is also operative in patients with chronic exocrine **pancreatic** insufficiency. It explains why fat malabsorption develops earlier compared with protein or starch malabsorption. The substitution of **lipase** is also more difficult than that of other enzymes, because it is more rapidly destroyed by proteases. Conversely, inactivation of proteases improves intraluminal activity of **lipase** not only in healthy individuals but also in patients with chronic **pancreatitis**. Other factors that contribute to problems in **lipase** substitution therapy include acid-peptic destruction of unprotected enzyme prepns. and unphysiol. particle sizes of enteric-coated capsules or pellets. Recent data suggest that the adaptation of the diam. of enteric-coated **pancreatin** micropellets into the range that permits gastric emptying in synchronicity with the meal improves their digestive efficacy.
IT **9001-62-1, Lipase**
RL: PRP (Properties)
(degrdn. of, in intestine lumen, in humans in health and **pancreatic** insufficiency)

L40 ANSWER 32 OF 68 HCAPLUS COPYRIGHT 2001 ACS
AN 1994:99977 HCAPLUS
DN 120:99977
TI Human **pancreatic lipase** activity: Review of methods and general recommendations
AU Ferard, G.; Lessinger, J. M.
CS Lab. Biochim. Appl., Univ. Louis-Pasteur, Illkirch, 67401, Fr.
SO Ann. Biol. Clin. (1992), 50(3), 133-41
CODEN: ABCLAI; ISSN: 0003-3898
DT Journal; General Review
LA French
AB A review with 111 refs. The properties of human **pancreatic lipase** were described, esp. as regards the influence of the nature and presentation of substrate as well as the effects of bile salts and **colipase**. The authors established a classification of the described methods for the detn. of **lipase** activity in serum or plasma and proposed recommendations for the detn. of this activity.
IT **9001-62-1, Pancreatic lipase**
RL: ANT (Analyte); ANST (Analytical study)
(detn. and properties of, of human **pancreas**)

L40 ANSWER 33 OF 68 HCAPLUS COPYRIGHT 2001 ACS
AN 1992:101478 HCAPLUS
DN 116:101478
TI **Pancreatic lipase**
AU Miyake, Kazunori; Hayashi, Yasuyuki
CS Med. Sch., Juntendo Univ., Tokyo, 113, Japan
SO Rinsho Byori, Rinji Zokan (1991), 89, 24-34
CODEN: RBRIAX; ISSN: 0370-3800

DT Journal; General Review
LA Japanese
AB A review with 43 refs. on the characteristics, structure and the assay method of **pancreatic lipase**.
IT **9001-62-1, Lipase**
RL: BIOL (Biological study)
(of **pancreas**, detn. and characterization and structure of)

L40 ANSWER 34 OF 68 HCAPLUS COPYRIGHT 2001 ACS
AN 1991:674009 HCAPLUS
DN 115:274009
TI Substrate specifity of porcine **pancreatic lipase** studied in terms of the steady-state kinetics binding and rate constants
AU Valmsen, K.; Lookene, A.; Sikk, P.
CS Inst. Chem. Phys. Biophys., Tallinn, 200026, USSR
SO GBF Monogr. (1991), 16(Lipases), 173-81
CODEN: GBMOEB
DT Journal; General Review
LA English
AB A review and discussion with 35 refs., of the substrate specificity of porcine **pancreatic lipase** on emulsified triacylglycerol substrates in the system **lipase/colipase** /micellar Na taurodeoxycholate/triacylglycerol emulsion.
IT **9001-62-1, Lipase**
RL: BIOL (Biological study)
(substrate specificity of, of pig **pancreas**, for emulsified triacylglycerols)

L40 ANSWER 35 OF 68 HCAPLUS COPYRIGHT 2001 ACS
AN 1991:674008 HCAPLUS
DN 115:274008
TI Chemical modification of the porcine **pancreatic lipase**
AU Lookene, A.; Sikk, P.
CS Inst. Chem. Phys. Biophys., Tallinn, 200026, USSR
SO GBF Monogr. (1991), 16(Lipases), 165-72
CODEN: GBMOEB
DT Journal; General Review
LA English
AB A review with 40 refs., of functional groups of **lipase** of porcine **pancreas**, as studied by chem. modification. Emphasis is given to the catalytic triad (Ser-152, Asp-176, and histidine), Lys-373, and the N-terminal amino group.
IT **9001-62-1, Lipase**
RL: PRP (Properties)
(functional groups in, of pig **pancreas**, chem. modification studies of)

L40 ANSWER 36 OF 68 HCAPLUS COPYRIGHT 2001 ACS
AN 1991:674006 HCAPLUS
DN 115:274006
TI **Lipases** in reverse micelles
AU Walde, Peter; Luisi, Pier Luigi
CS Inst. Polym., Eidg. Tech. Hochsch., Zurich, Switz.
SO GBF Monogr. (1991), 16(Lipases), 155-8
CODEN: GBMOEB
DT Journal; General Review
LA English
AB A review, with 7 refs., of 2 independent spectroscopic methods, Fourier-transformed IR and via absorption spectroscopy, to assay **lipases** continuously with triacylglycerol substrates in a reverse micellar soln. With the two methods, a simple and unique possibility is offered to study the kinetics and the specificity of **lipases**, embedded in a system which possibly mimics the biol. relevant environment of lipolytic enzymes. Preliminary activity data for the **colipase** -dependent human **pancreatic lipase** in reverse micelles is also presented.

IT **9001-62-1**, Triacylglycerol **lipase**
RL: ANT (Analyte); ANST (Analytical study)
(detn. of, in triglyceride reverse micelles, spectroscopic methods for)

L40 ANSWER 37 OF 68 HCAPLUS COPYRIGHT 2001 ACS
AN 1991:444702 HCAPLUS
DN 115:44702
TI **Pancreatic lipase**
AU Hayashi, Yasuyuki
CS Sch. Med., Juntendo Univ., Tokyo, 113, Japan
SO Rinsho Byori (1991), 39(5), 451-60
CODEN: RBYOAI; ISSN: 0047-1860
DT Journal; General Review
LA Japanese
AB A review with 14 refs., on isolation, purifn., and characterization of **pancreatic lipase** (EC,3.1.1.3), and prepn. of monoclonal antibody for the **lipase** from mouse myeloma cell and its application to the enzyme immunoassay system.
IT **9001-62-1P, Lipase**
RL: PREP (Preparation)
(of **pancreas**, purifn. and characterization of, immunoassay in relation to)

L40 ANSWER 38 OF 68 HCAPLUS COPYRIGHT 2001 ACS
AN 1990:528406 HCAPLUS
DN 113:128406
TI Structure of human **pancreatic lipase**
AU Shipley, G. Graham
CS Boston Univ., Boston, MA, USA
SO Chemtracts: Biochem. Mol. Biol. (1990), 1(3), 249-51
CODEN: CMBIE5; ISSN: 1045-2680
DT Journal; General Review
LA English
AB The title research of F. K. Winkler et al. (1990) is reviewed with commentary and 5 refs.
IT **9001-62-1, Lipase**
RL: PRP (Properties)
(structure of, of human **pancreas**)

L40 ANSWER 39 OF 68 HCAPLUS COPYRIGHT 2001 ACS
AN 1989:53354 HCAPLUS
DN 110:53354
TI Catalytic activity and association of **pancreatic lipase**
AU Antonov, V. K.; D'yakov, V. L.; Mishin, A. A.; Rotanova, T. V.
CS M. M. Shemyakin Inst. Bioorg. Chem., Moscow, USSR
SO Biochimie (1988), 70(9), 1235-44
CODEN: BICMBE; ISSN: 0300-9084
DT Journal; General Review
LA English
AB A review with 27 refs., primarily of the authors' work, of the mechanism of **pancreatic lipase** activation. The activation of **lipase** by submicellar SDS concns. closely imitates its activation by an interface. **Lipase** activation is caused by changes in the rate consts. for substrate chem. transformation and involves conformation changes of the enzyme and its assocn. The complex of a conformationally modified **lipase** with the detergent, which acts as a structure-forming agent, is assocd. with native **lipase** mols. setting up their active site. The mechanism of **lipase** activation at an interface both in vitro and in vivo is discussed.
IT **9001-62-1, Lipase**
RL: BIOL (Biological study)
(activation of, of **pancreas**, mechanism of, mol. assocn. in relation to)

L40 ANSWER 40 OF 68 HCAPLUS COPYRIGHT 2001 ACS
AN 1989:35755 HCAPLUS

DN 110:35755
TI Minireview on **pancreatic lipase** and **colipase**
AU Chapus, Catherine; Rovery, Mireille; Sarda, Louis; Verger, Robert
CS Cent. Biochim. Biol. Mol., Cent. Natl. Rech. Sci., Marseille, 13402, Fr.
SO Biochimie (1988), 70(9), 1223-34
CODEN: BICMBE; ISSN: 0300-9084
DT Journal; General Review
LA English
AB A review, with 15 refs., on **pancreatic lipase** and **colipase**. Emphasis is placed on their structure, mechanism of action, and regulation.
IT **9001-62-1**
RL: BIOL (Biological study)
(structure and mechanism and regulation of)

L40 ANSWER 41 OF 68 HCAPLUS COPYRIGHT 2001 ACS
AN 1986:49312 HCAPLUS
DN 104:49312
TI Lipoprotein **lipase** and hepatic triglyceride **lipase** activities in diseases of liver and **pancreas**
AU Murase, Toshiro; Aburatani, Hiroyuki
CS Med. Sch., Tokyo Univ., Tokyo, Japan
SO Kan, Tan, Sui (1985), 11(3), 429-32
CODEN: KTSUDO; ISSN: 0389-4991
DT Journal; General Review
LA Japanese
AB A review with 12 refs., discussing detn. of human blood lipoprotein **lipase** (LPL) and hepatic triglyceride **lipase** (TGL) and changes in activities of LPL and TGL in hepatobiliary and **pancreatic** diseases.
IT **9001-62-1**
RL: BIOL (Biological study)
(liver-assocd., of blood in hepatobiliary and **pancreatic** diseases in humans)

L40 ANSWER 42 OF 68 HCAPLUS COPYRIGHT 2001 ACS
AN 1984:608407 HCAPLUS
DN 101:208407
TI Diagnostic significance of a new enzyme immunoassay for determination of human **pancreatic lipase**
AU Dati, F.
CS Forschungslab., Behringwerke A.-G., Marburg/Lahn, 3550, Fed. Rep. Ger.
SO MTA-J. (1984), 6(9), 362-6, 368
CODEN: MTJODH; ISSN: 0171-8037
DT Journal; General Review
LA German
AB A review, with 22 refs., of a com. enzyme immunoassay kit for detg. **pancreatic lipase** and its use in the diagnosis of **pancreatitis** and other **pancreatic** diseases. Ranges of normal and pathol. values are given.
IT **9001-62-1**
RL: BIOL (Biological study)
(of **pancreas** of humans, enzyme immunoassay of, **pancreas** disease diagnosis by)

L40 ANSWER 43 OF 68 HCAPLUS COPYRIGHT 2001 ACS
AN 1984:565948 HCAPLUS
DN 101:165948
TI The **pancreatic lipase/colipase** system
AU Mueller, Gerhard
CS Med. Klin. Poliklin., Martin-Luther-Univ. Halle-Wittenberg, Halle/Saale, Ger. Dem. Rep.
SO Z. Gesamte Inn. Med. Ihre Grenzgeb. (1984), 39(14), 321-5
CODEN: ZGIMAL; ISSN: 0044-2542
DT Journal; General Review
LA German

AB A review with 41 refs.
IT **9001-62-1**
RL: BIOL (Biological study)
(of **pancreas, colipase** in relation to)

L40 ANSWER 44 OF 68 HCAPLUS COPYRIGHT 2001 ACS
AN 1984:525434 HCAPLUS
DN 101:125434
TI **Pancreatic lipases**
AU Verger, Robert
CS Cent. Biochim. Biol. Mol., CNRS, Marseille, 13402/9, Fr.
SO Lipases (1984), 83-150. Editor(s): Borgstroem, Bengt; Brockman, Howard L. Publisher: Elsevier, Amsterdam, Neth.
CODEN: 52BFAV
DT Conference; General Review
LA English
AB A review, with 217 refs., of the detn., purifn., properties, reaction mechanism, and physiol. function of **pancreatic lipases**
.
IT **9001-62-1**
RL: BOC (Biological occurrence); BIOL (Biological study); OCCU (Occurrence)
(of **pancreas**)

L40 ANSWER 45 OF 68 HCAPLUS COPYRIGHT 2001 ACS
AN 1984:116824 HCAPLUS
DN 100:116824
TI Assay methods for **lipase** of **pancreatic** origin
AU Kurooka, Shigeru
CS Res. Lab., Dainippon Pharm. Co., Ltd., Osaka, Japan
SO Med. Technol. (Tokyo) (1984), 12(1), 31-9
CODEN: METCDS
DT Journal; General Review
LA Japanese
AB A review with 41 refs. esp. about the detn. of **pancreatic lipase** in blood serum.
IT **9001-62-1**
RL: ANT (Analyte); ANST (Analytical study)
(detn. of, in blood serum)

L40 ANSWER 46 OF 68 HCAPLUS COPYRIGHT 2001 ACS
AN 1984:47453 HCAPLUS
DN 100:47453
TI The **pancreatic lipase-colipase** system throughout evolution
AU Leger, C.
CS Stn. Rech. Nutri., INRA, Jouy-en-Josas, 78350, Fr.
SO Sci. Vet.--Med. Comp. (1983), 85(2), 111-13
CODEN: SVMCD8; ISSN: 0750-7682
DT Journal; General Review
LA French
AB A review with 17 refs.
IT **9001-62-1**
RL: PROC (Process)
(-**colipase** system, of **pancreas**, evolution of)

L40 ANSWER 47 OF 68 HCAPLUS COPYRIGHT 2001 ACS
AN 1982:195565 HCAPLUS
DN 96:195565
TI **Pancreatic lipase** - a review
AU Lorentz, K.; Weiss, T.
CS Inst. Klin. Chem., Med. Hochsch., Luebeck, 2400, Fed. Rep. Ger.
SO Med. Lab. (1981), 34(11), 272-7
CODEN: MDLBA9; ISSN: 0025-8466
DT Journal; General Review
LA German

AB A review, with 75 refs., of the biochem.-phys. properties, action, detn., regulation, and physiol. significance of **pancreatic lipase**.
IT **9001-62-1**
RL: BOC (Biological occurrence); BIOL (Biological study); OCCU (Occurrence)
(of **pancreas**)

L40 ANSWER 48 OF 68 HCAPLUS COPYRIGHT 2001 ACS
AN 1981:527987 HCAPLUS
DN 95:127987
TI Triglyceride **lipase** from porcine **pancreas**
AU Brockman, Howard L.
CS Hormel Inst., Univ. Minnesota, Austin, MN, 55912, USA
SO Methods Enzymol. (1981), 71(Lipids, Pt. C), 619-27
CODEN: MENZAU; ISSN: 0076-6879
DT Journal; General Review
LA English
AB A review with 21 refs. Procedures for the assay and purifn. of triglyceride **lipase** (EC 3.1.1.3) from porcine **pancreas** are described. The properties of this enzyme are also summarized.
IT **9001-62-1P**
RL: PREP (Preparation)
(of porcine **pancreas**, purifn. and properties of)

L40 ANSWER 49 OF 68 HCAPLUS COPYRIGHT 2001 ACS
AN 1981:153891 HCAPLUS
DN 94:153891
TI New results on the role of **lipase**, **colipase** and bile acids in fat digestion
AU Mueller, G.
CS II. Med. Klin. Poliklin., Martin-Luther-Univ. Halle-Wittenberg, Halle/Saale, DDR-4020, Ger. Dem. Rep.
SO Dtsch. Z. Verdau.- Stoffwechselkr. (1980), 40(6), 246-52
CODEN: DZVSAT; ISSN: 0012-1053
DT Journal; General Review
LA German
AB A review with 73 refs.
IT **9001-62-1**
RL: BIOL (Biological study)
(in fat digestion)

L40 ANSWER 50 OF 68 HCAPLUS COPYRIGHT 2001 ACS
AN 1981:43446 HCAPLUS
DN 94:43446
TI Laboratory diagnosis of exocrine **pancreas** diseases. Part II
AU Jochem, R.; Thomas, L.
CS Dtsch. Klin. Diagn., Wiesbaden, 6200, Fed. Rep. Ger.
SO MTA-J. (1980), 2(10), 382-5
CODEN: MTJODH
DT Journal; General Review
LA German
AB The 2nd part of a review with 13 refs. of the detn. of **lipase**, trypsin, and carcinoembryonic antigen in blood, chymotrypsin and fat in feces, fluorescein and p-aminobenzoate in urine (after the administration of fluorescein dilaurate or N-benzoyl-L-tyrosyl-p-aminobenzoate), and secretin and cholecystokinin in duodenal juice in relation to the diagnosis of exocrine **pancreas** diseases.
IT **9001-62-1**
RL: ANT (Analyte); ANST (Analytical study)
(detn. of, in blood, **pancreatic** disease diagnosis in relation to)

L40 ANSWER 51 OF 68 HCAPLUS COPYRIGHT 2001 ACS
AN 1980:464175 HCAPLUS
DN 93:64175

TI **Pancreatic lipase**
AU Leger, C.; Charles, M.
CS Cent. Natl. Rech. Zootech., Inst. Natl. Rech. Agron., Jouy-en-Josas, F-78350, Fr.
SO World Rev. Nutr. Diet. (1980), 35(Hum. Nutr. Nutr. Pestic. Cattle), 96-128
CODEN: WRNDAT; ISSN: 0084-2230
DT Journal; General Review
LA English
AB A review with 132 refs.
IT **9001-62-1**
RL: BOC (Biological occurrence); BIOL (Biological study); OCCU (Occurrence)
(of **pancreas**)

L40 ANSWER 52 OF 68 HCAPLUS COPYRIGHT 2001 ACS
AN 1979:555470 HCAPLUS
DN 91:155470
TI **Pancreatic lipase** - biochemical and clinical aspects
AU Rublewska, Maria; Prokopowicz, Jan
CS Zakl. Diagn. Klin., Inst. Biochem. Anal. Med., Bialymstoku, Pol.
SO Przegl. Lek. (1979), 36(6), 493-7
CODEN: PRLKAV; ISSN: 0033-2240
DT Journal; General Review
LA Polish
AB A review with 50 refs. of the properties of **lipase**, its role in **pancreatic** diseases, and its applications in diagnosis.
IT **9001-62-1**
RL: BIOL (Biological study)
(biochem. and clin. aspects of)

L40 ANSWER 53 OF 68 HCAPLUS COPYRIGHT 2001 ACS
AN 1979:553666 HCAPLUS
DN 91:153666
TI **Pancreas** diagnostics: enzyme determination with 8-phenyloctanoic acid vinyl ester as the substrate
AU Junge, W.; Leybold, K.
CS Zentrallab., Staedtisches Krankenhaus, Kiel, 2300/1, Fed. Rep. Ger.
SO Laboratoriumsbl. Med. Diagn. E. v. Behring (1979), 29(2), 74-9
CODEN: LABLDS; ISSN: 0023-673X
DT Journal; General Review
LA German
AB A review with 9 refs.
IT **9001-62-1**
RL: ANST (Analytical study)
(of blood serum, phenyloctanoic vinyl ester as substrate for, in **pancreas** disease diagnosis)

L40 ANSWER 54 OF 68 HCAPLUS COPYRIGHT 2001 ACS
AN 1979:147412 HCAPLUS
DN 90:147412
TI Mode of action of **pancreatic colipase**
AU Borgstrom, Bengt
CS Dep. Physiol. Chem., Univ. Lund, Lund, Swed.
SO Adv. Exp. Med. Biol. (1978), 101(Enzymes Lipid Metab.), 69-78
CODEN: AEMBAP; ISSN: 0065-2598
DT Journal; General Review
LA English
AB A review with 19 refs.
IT **9001-62-1**
RL: BIOL (Biological study)
(**colipase** interaction with)

L40 ANSWER 55 OF 68 HCAPLUS COPYRIGHT 2001 ACS
AN 1979:147411 HCAPLUS
DN 90:147411
TI Adsorption and activation of **pancreatic lipase** at

interfaces
AU Chapus, C.; Semeriva, M.; Charles, M.; Desnuelle, P.
CS Cent. Biochim. Biol. Mol., Marseille, Fr.
SO Adv. Exp. Med. Biol. (1978), 101(Enzymes Lipid Metab.), 57-68
CODEN: AEMBAP; ISSN: 0065-2598
DT Journal; General Review
LA English
AB A review and discussion with 35 refs.
IT **9001-62-1**
RL: BIOL (Biological study)
(activation and adsorption of, at lipid-water interfaces)

L40 ANSWER 56 OF 68 HCAPLUS COPYRIGHT 2001 ACS
AN 1979:116840 HCAPLUS
DN 90:116840
TI **Pancreatic lipase** and **colipase**. An example of heterogeneous biocatalysis
AU Semeriva, M.; Desnuelle, P.
CS Cent. Biochim. Biol. Mol., CNRS, Marseille, Fr.
SO Adv. Enzymol. Relat. Areas Mol. Biol. (1979), 48, 319-70
CODEN: AERAAD; ISSN: 0065-258X
DT Journal; General Review
LA English
AB A review with 130 refs.
IT **9001-62-1**
RL: BOC (Biological occurrence); BIOL (Biological study); OCCU (Occurrence)
(of **pancreas**)

L40 ANSWER 57 OF 68 HCAPLUS COPYRIGHT 2001 ACS
AN 1978:186649 HCAPLUS
DN 88:186649
TI **Pancreatic** enzymes in the **pancreatic** secretions
AU Janowitz, Henry D.; Banks, Peter A.
CS Mount Sinai Sch. Med., New York, N. Y., USA
SO Sci. Pract. Clin. Med. (1976), Volume 1, 195. Editor(s): Dietschy, John M. Publisher: Grune & Stratton, New York, N. Y.
CODEN: 35BZAM
DT Conference; General Review
LA English
AB A review with no refs.
IT **9001-62-1**
RL: BOC (Biological occurrence); BIOL (Biological study); OCCU (Occurrence)
(of **pancreatic** juice)

L40 ANSWER 58 OF 68 HCAPLUS COPYRIGHT 2001 ACS
AN 1978:34870 HCAPLUS
DN 88:34870
TI The production of trypsin, carboxypeptidase, **lipase** and deoxyribonuclease in the **pancreas**
AU Funakoshi, Akihiro
CS Sch. Med., Kyushu Univ., Fukuoka, Japan
SO Igaku No Ayumi (1977), 103(5), 328-34
CODEN: IGAYAY
DT Journal; General Review
LA Japanese
AB A review with 46 refs. on recent advances in the quant. distribution of 11 **pancreatic** juice enzymes on a protein wt. basis, chromatog. fractionation of **lipase** and DNase into subclasses, and mechanism of some zymogens to active enzymes.
IT **9001-62-1**
RL: FORM (Formation, nonpreparative)
(formation of, by **pancreas**)

L40 ANSWER 59 OF 68 HCAPLUS COPYRIGHT 2001 ACS

AN 1977:13025 HCAPLUS
DN 86:13025
TI The estimation of **pancreatic lipase** - a brief review
AU Williamson, T.
CS Gloucester Area Pathol. Lab., Gloucestershire R. Hosp., Gloucester, Engl.
SO Med. Lab. Sci. (1976), 33(4), 265-79
CODEN: MLASDU
DT Journal; General Review
LA English
AB A review with 101 refs., of the detn. of **pancreatic lipase** in blood serum and **pancreatic** secretions. The value of serum **lipase** detns. in acute **pancreatitis** is discussed.
IT **9001-62-1**
RL: BIOL (Biological study)
(detn. of **pancreatic**)

L40 ANSWER 60 OF 68 HCAPLUS COPYRIGHT 2001 ACS
AN 1976:473961 HCAPLUS
DN 85:73961
TI **Pancreatic lipase** and **colipase**: an example of heterogeneous biocatalysis
AU Semeriva, Michel; Desnuelle, Pierre
CS Cent. Biochem. Biol. Mol., Marseille, Fr.
SO Horiz. Biochem. Biophys. (1976), 2, 32-59
CODEN: HZBBAO
DT Journal; General Review
LA English
AB A review with 39 refs.
IT **9001-62-1**
RL: BOC (Biological occurrence); BIOL (Biological study); OCCU (Occurrence)
(of **pancreas**)

L40 ANSWER 61 OF 68 HCAPLUS COPYRIGHT 2001 ACS
AN 1975:69534 HCAPLUS
DN 82:69534
TI **Lipase**. Titrimetric measurement
AU Naeher, Gotthilf
CS Biochem. Werk Tutzing, Boehringer Mannheim G.m.b.H., Tutzing/Obb., Ger.
SO Methoden Enzym. Anal., 3. Neubearbeitete Erweiterte Aufl. (1974), Volume 1, 843-8. Editor(s): Bergmeyer, Hans Ulrich. Publisher: Verlag Chem., Weinheim/Bergstr., Ger.
CODEN: 29GMAP
DT Conference; General Review
LA German
AB A review with 22 refs., of titrimetric methods for **lipase** detn. in blood serum, intestinal juice, **pancreatic** juice, milk, and **pancreatin**-contg. pharmaceutical prepns.
IT **9001-62-1**
RL: ANT (Analyte); ANST (Analytical study)
(detn. of, titrimetric)

L40 ANSWER 62 OF 68 HCAPLUS COPYRIGHT 2001 ACS
AN 1974:129626 HCAPLUS
DN 80:129626
TI **Lipases**
AU Desnuelle, P.
CS Inst. Chim. Biol., Univ. Provence, Marseilles, Fr.
SO Enzymes, 3rd Ed. (1972), Volume 7, 575-616. Editor(s): Boyer, Paul D. Publisher: Academic, New York, N. Y.
CODEN: 25GLAS
DT Conference; General Review
LA English
AB A review with 207 refs.
IT **9001-62-1**

RL: BIOL (Biological study))

L40 ANSWER 63 OF 68 HCAPLUS COPYRIGHT 2001 ACS
AN 1974:92421 HCAPLUS
DN 80:92421
TI Recent findings on **pancreatic lipase** and **colipase**
AU Desnuelle, P.
CS Cent. Biochim. Biol. Mol., Marseilles, Fr.
SO Dietary Lipids Postnatal Develop. (1973), 73-6. Editor(s): Galli, C. Publisher: Raven Press, Publ., New York, N. Y.
CODEN: 27LOA8
DT Conference; General Review
LA English
AB Some characteristic properties of **pancreatic lipase** are reviewed with 9 refs. The **pancreatic** cofactor, **colipase**, which prevents **lipase** inhibition by the bile salt concn. normally present in the duodenum during lipolysis was also discussed.
IT **9001-62-1**
RL: BIOL (Biological study)
(of **pancreas**, properties of **colipase** and)

L40 ANSWER 64 OF 68 HCAPLUS COPYRIGHT 2001 ACS
AN 1973:440608 HCAPLUS
DN 79:40608
TI Serum and urinary enzymes in **pancreas** pathology. Review of methods
AU Gilardoni, Angel; Szmulewicz, German
CS Fac. Farm. Bioquim., Univ. Buenos Aires, Buenos Aires, Argent.
SO Rev. Asoc. Bioquim. Argent. (1972), 37(203-204), 135-42
CODEN: RABAAO
DT Journal; General Review
LA Spanish
AB The methods for assay of serum and urinary amylase and **lipase** were reviewed. 47 refs.
IT **9001-62-1**
RL: BIOL (Biological study)
(of blood serum and urine, in **pancreas** disease)

L40 ANSWER 65 OF 68 HCAPLUS COPYRIGHT 2001 ACS
AN 1973:155766 HCAPLUS
DN 78:155766
TI Methods and problems of determining **pancrease lipase** activity in serum
AU Mueller, G.
CS II. Med. Klin. Poliklin., Martin-Luther-Univ., Halle-Wittenberg, E. Ger.
SO Deut. Gesundheitsw. (1973), 28(1), 33-8
CODEN: DEGEA3
DT Journal; General Review
LA German
AB A review. Synthetic substrates are not specific. Serum **lipase** activity should be detd. by means of emulsified triglycerides, either olive oil or triolein. The photometric detn. of fatty acids released as Cu soaps makes possible the measurement of **lipase** activity in 50 .mu.l serum after incubation for min at 25.degree.. 102 Refs.
IT **9001-62-1**
RL: ANT (Analyte); ANST (Analytical study)
(detn. of, in blood serum)

L40 ANSWER 66 OF 68 HCAPLUS COPYRIGHT 2001 ACS
AN 1973:68567 HCAPLUS
DN 78:68567
TI Recent data on enzymes of the exocrine **pancreas**
AU Desnuelle, P.
CS Cent. Biochim. Biol. Mol., CNRS, Marseilles, Fr.

SO C. R. Soc. Biol. (1972), 166(2-3), 238-53
CODEN: CRSBAW
DT Journal; General Review
LA French
AB A review and discussion of the **pancreatic** zymogens, trypsinogen, and chymotrypsinogen, and **pancreatic lipase** (action on mols. sol. and insol. in water, effect of bile salts on **lipase**, existence of a **colipase**). Regulation of biosynthesis of **pancreatic** enzymes (influence of diet and role of insulin in the biosynthesis of **pancreatic** amylase) is also discussed. 28 refs.
IT **9001-62-1**
RL: BOC (Biological occurrence); BIOL (Biological study); OCCU (Occurrence)
(of **pancreas**)

L40 ANSWER 67 OF 68 HCAPLUS COPYRIGHT 2001 ACS
AN 1972:536633 HCAPLUS
DN 77:136633
TI Elusive **pancreatic lipase**
AU Massion, Charles G.
CS Health Cent., Univ. Connecticut, Storrs, Conn., USA
SO Lab. Med. (1971), 2(2), 26, 27, 30
CODEN: LBMEBX
DT Journal; General Review
LA English
AB The relation of **pancreatic lipase** to acute **pancreatitis** is reviewed and various tests for this **lipase** are described, esp. the Cherry-Crandall method which used an olive oil emulsion as the substrate. 20 refs.
IT **9001-62-1**
RL: BIOL (Biological study)
(**pancreatitis** in relation to)

L40 ANSWER 68 OF 68 HCAPLUS COPYRIGHT 2001 ACS
AN 1972:444629 HCAPLUS
DN 77:44629
TI Influence of the structure of the alcohol on the reactivity of esters of fatty acids in comparison with **pancreatic lipase**
AU Derbesy, Michel; Naudet, Maurice
CS Lab. Chim. Corps Gras, Univ. Provence, Marseilles, Fr.
SO Rev. Fr. Corps Gras (1972), 19(4), 225-32
CODEN: RFCGAE
DT Journal; General Review
LA French
AB A review, with 20 refs. The principles of enzymic action are briefly discussed, as well as the particular characteristics of **pancreatic lipase**. Data are reviewed which point to the important role of the degree of substitution of the functional C atom and the C atom in the .alpha. position thereto in the alc. moiety, in detg. susceptibility of a fatty acid ester to hydrolysis by the **lipase**. The mechanism of lipolytic inhibition by substitution of these atoms in the alc. moiety is considered.
IT **9001-62-1**
RL: MSC (Miscellaneous); PRP (Properties)
(reaction mechanism of, alc. structure in relation to)

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=> d all tot

L64 ANSWER 1 OF 16 MEDLINE
AN 2001080109 MEDLINE
DN 20552949 PubMed ID: 11099796
TI Properties and function of **pancreatic lipase** related protein 2.
AU Lowe M E
CS Washington University and St. Louis Children's Hospital, One Children's Place, St. Louis, MO 63141, USA.. Lowe@pcfnotes1.wustl.edu
NC DK53100 (NIDDK)
HD33060 (NICHD)
SO BIOCHIMIE, (2000 Nov) 82 (11) 997-1004. Ref: 40
Journal code: A14. ISSN: 0300-9084.
CY France
DT Journal; Article; (JOURNAL ARTICLE)
General Review; (REVIEW)
(REVIEW, TUTORIAL)
LA English
FS Priority Journals
EM 200101
ED Entered STN: 20010322
Last Updated on STN: 20010322
Entered Medline: 20010111
AB The **lipase** gene family includes **pancreatic** triglyceride **lipase** and two **pancreatic** proteins, **pancreatic lipase** related proteins 1 and 2, with strong nucleotide and amino acid sequence homology to **pancreatic** triglyceride **lipase**. All three proteins have virtually identical three-dimensional structures. Of the **pancreatic** triglyceride **lipase** homologues, only **pancreatic lipase** related protein 2 has **lipase** activity. Like **pancreatic** triglyceride **lipase**, related protein 2 cleaves triglycerides, but it has broader substrate specificity. **Pancreatic lipase** related protein 2 also hydrolyzes phospholipids and galactolipids, two fats that are not substrates for **pancreatic** triglyceride **lipase**. The rat-related protein 2 also differs from **pancreatic** triglyceride **lipase** in sensitivity to bile salts and in response to colipase. Although the **pancreas** expresses both **lipases**, their temporal pattern of expression differs. **Pancreatic lipase**-related protein 2 mRNA appears before birth and persists into adulthood, whereas PTL mRNA first appears at the suckling-weanling transition. Additionally, intestinal enterocytes, paneth cells and cultured cytotoxic T-cells express mRNA encoding **pancreatic lipase** related protein 2. A physiological function for **pancreatic lipase** related protein 2 was demonstrated in mice that did not express this protein. **Pancreatic lipase** related protein 2 deficient mice malabsorbed fat in the suckling period, but not after weaning. They also had a defect in T-cell mediated cytotoxicity. Thus, **pancreatic lipase** related protein 2 is a **lipase** that participates

in the cytotoxic activity of T-cells and plays a critical role in the digestion of breast milk fats.
CT Check Tags: Animal; Human; Support, U.S. Gov't, P.H.S.
Kinetics
Lipase: CH, chemistry
Lipase: GE, genetics
*Lipase: ME, metabolism
Protein Conformation
CN EC 3.1.1.- (**pancreatic lipase** related protein 2); EC 3.1.1.3 (Lipase)

L64 ANSWER 2 OF 16 MEDLINE
AN 2001080108 MEDLINE
DN 20552948 PubMed ID: 11099795
TI Kinetic behavior of the **pancreatic lipase** -colipase-lipid system.
AU Brockman H L
CS The Hormel Institute, University of Minnesota, 801 NE 16th Avenue, MN 55912, Austin, USA.. hlbroc@smig.net
NC HL-49180 (NHLBI)
SO BIOCHIMIE, (2000 Nov) 82 (11) 987-95. Ref: 74
Journal code: A14. ISSN: 0300-9084.
CY France
DT Journal; Article; (JOURNAL ARTICLE)
General Review; (REVIEW)
(REVIEW, TUTORIAL)
LA English
FS Priority Journals
EM 200101
ED Entered STN: 20010322
Last Updated on STN: 20010322
Entered Medline: 20010111
AB **Pancreatic lipase** is a surface-active protein that binds avidly to interfaces comprised of the substrates and products of lipolysis. However, both **lipase** binding to substrate-containing particles and subsequent interfacial catalysis are inhibited by a number of amphipathic molecules. The most thoroughly studied of these, phosphatidylcholine, is a common constituent of membranes and intestinal lipid contents. Colipase, a surface-active cofactor of **lipase**, relieves inhibition by phosphatidylcholine in several ways. Through protein-protein interactions, colipase helps anchor **lipase** to surfaces and stabilizes it in the open conformation. Within the interface, colipase packs more efficiently with substrates and products of lipolysis than with phosphatidylcholine, thereby concentrating these reactants in the vicinity of colipase. This enrichment of **lipase** substrates and products in the vicinity of colipase enhances **lipase**-lipid interactions. The result is that colipase facilitates the adsorption of **lipase** to the interface and, possibly, increases the availability of substrate to the enzyme. Thus, the functional unit in intestinal lipolysis appears to be a **lipase**-colipase-reactant complex.
CT Check Tags: Human; Support, Non-U.S. Gov't; Support, U.S. Gov't, P.H.S.
Kinetics
*Lipase: ME, metabolism
*Lipids: ME, metabolism
Lipolysis
***Pancreas: EN, enzymology**
CN 0 (Lipids); EC 3.1.1.3 (Lipase)

L64 ANSWER 3 OF 16 MEDLINE
AN 2001015135 MEDLINE
DN 20451220 PubMed ID: 10995195
TI Covalent inhibition of digestive **lipases** by chiral phosphonates.
AU Cavalier J F; Buono G; Verger R
CS Laboratoire de Lipolyse Enzymatique, UPR 9025, IFR 1 du CNRS, 31 Chemin Joseph Aiguier, F-13402 Marseille Cedex 20, France.
SO Acc Chem Res, (2000 Sep) 33 (9) 579-89. Ref: 53

Journal code: DJP. ISSN: 0001-4842.
CY United States
DT Journal; Article; (JOURNAL ARTICLE)
General Review; (REVIEW)
(REVIEW, TUTORIAL)
LA English
FS Priority Journals
EM 200010
ED Entered STN: 20010322
Last Updated on STN: 20010322
Entered Medline: 20001030
AB Designing and synthesizing specific inhibitors is of fundamental value for understanding the molecular mechanisms involved in the interfacial adsorption step as well as the catalytic activity of **lipases**. In this Account, we will review and discuss results obtained mostly at our laboratory concerning the covalent inhibition of human gastric and human **pancreatic lipases** by chiral phosphonates. Rather than presenting an exhaustive list of compounds tested so far with **lipases** of animal and microbial origin, we selected recent experimental data illustrating well the specific problems encountered during the covalent inhibition of these digestive **lipases**.
CT Check Tags: Human
*Enzyme Inhibitors: PD, pharmacology
*Gastric Mucosa: EN, enzymology
Lactones: PD, pharmacology
*Lipase: AI, antagonists & inhibitors
***Pancreas: EN, enzymology**
Phosphonic Acids: CH, chemistry
*Phosphonic Acids: PD, pharmacology
Stereoisomerism
RN 96829-58-2 (orlistat)
CN 0 (Enzyme Inhibitors); 0 (Lactones); 0 (Phosphonic Acids); EC 3.1.1.3 (Lipase)

L64 ANSWER 4 OF 16 MEDLINE
AN 2000039906 MEDLINE
DN 20039906 PubMed ID: 10570245
TI Colipase: structure and interaction with **pancreatic lipase**.
AU van Tilbeurgh H; Bezzine S; Cambillau C; Verger R; Carriere F
CS Architecture et Fonction des Macromolecules Biologiques, CNRS-IFR1 UPR9039, GBMA, 163 Avenue de Luminy Case 925, 13288, Marseille,. France.vantil@esil.univ-mrs.fr
SO BIOCHIMICA ET BIOPHYSICA ACTA, (1999 Nov 23) 1441 (2-3) 173-84. Ref: 52
Journal code: AOW; 0217513. ISSN: 0006-3002.
CY Netherlands
DT Journal; Article; (JOURNAL ARTICLE)
General Review; (REVIEW)
(REVIEW, TUTORIAL)
LA English
FS Priority Journals
EM 199912
ED Entered STN: 20000114
Last Updated on STN: 20000114
Entered Medline: 19991230
AB Colipase is a small protein cofactor needed by **pancreatic lipase** for the efficient dietary lipid hydrolysis. It binds to the C-terminal, non-catalytic domain of **lipase**, thereby stabilising an active conformation and considerably increasing the overall hydrophobic binding site. Structural studies of the complex and of colipase alone have clearly revealed the functionality of its architecture. Interestingly, a structural analogy has recently been discovered between colipase and a domain in a developmental protein (Dickkopf), based on sequence analogy and homology modeling. Whether this structural analogy implies a common function (lipid interaction) remains to be clarified. Structural analogies have also been recognised between the **pancreatic lipase**

C-terminal domain, the N-terminal domains of lipoxygenases and the C-terminal domain of alpha-toxin. These non-catalytic domains in the latter enzymes are important for interaction with membranes. It has not been established if these domains are also involved in eventual protein cofactor binding as is the case for **pancreatic lipase**.

CT Check Tags: Animal
Amino Acid Sequence
Binding Sites
*Colipases: CH, chemistry
*Colipases: ME, metabolism
Lipase: CH, chemistry
*Lipase: ME, metabolism
Models, Molecular
Molecular Sequence Data
***Pancreas: EN, enzymology**
Protein Conformation
Sequence Alignment
Structure-Activity Relationship

CN 0 (Colipases); EC 3.1.1.3 (Lipase)

L64 ANSWER 5 OF 16 MEDLINE
AN 1999023783 MEDLINE
DN 99023783 PubMed ID: 9805004
TI Structural basis for the substrate selectivity of **pancreatic lipases** and some related proteins.
AU Carriere F; Withers-Martinez C; van Tilbeurgh H; Roussel A; Cambillau C; Verger R
CS Laboratoire de Lipolyse Enzymatique, CNRS-IFR1 UPR 9025, 31 chemin Joseph Aiguier, 13402 Marseille cedex 20, France.
SO BIOCHIMICA ET BIOPHYSICA ACTA, (1998 Nov 10) 1376 (3) 417-32. Ref: 47
Journal code: A0W; 0217513. ISSN: 0006-3002.
CY Netherlands
DT Journal; Article; (JOURNAL ARTICLE)
General Review; (REVIEW)
(REVIEW, TUTORIAL)
LA English
FS Priority Journals
EM 199901
ED Entered STN: 19990115
Last Updated on STN: 19990115
Entered Medline: 19990104

AB The classical human **pancreatic lipase** (HPL), the guinea pig **pancreatic lipase**-related protein 2 (GPLRP2) and the phospholipase A1 from hornet venom (DolmI PLA1) illustrate three interesting steps in the molecular evolution of the **pancreatic lipase** gene family towards different substrate selectivities. Based on the known 3D structures of HPL and a GPLRP2 chimera, as well as the modeling of DolmI PLA1, we review here the structural features and the kinetic properties of these three enzymes for a better understanding of their structure-function relationships. HPL displays significant activity only on triglycerides, whereas GPLRP2 displays high phospholipase and galactolipase activities, together with a comparable **lipase** activity. GPLRP2 shows high structural homology with HPL with the exception of the lid domain which is made of five amino acid residues (mini-lid) instead of 23 in HPL. The lid domain deletion in GPLRP2 allows the free access to the active site and reduces the steric hindrance towards large substrates, such as galactolipids. The role of the lid domain in substrate selectivity has been investigated by site-directed mutagenesis and the substitution of HPL and GPLRP2 lid domains. The addition of a large-size lid domain in GPLRP2 increases the substrate selectivity for triglycerides by depressing the phospholipase activity. The phospholipase activity is, however, not induced in the case of the HPL mutant with GPLRP2 mini-lid. Therefore, the presence of a full-length lid domain is not the unique structural feature explaining the absence of phospholipase activity in HPL. The 3D structure of the GPLRP2 chimera and the model of DolmI PLA1 reveal a higher hydrophilic/lipophilic

balance (HLB) of the surface loops (beta5 loop, beta9 loop, lid domain) surrounding the active site, as compared to the homologous loops in HPL. This observation provides a potential explanation for the ability of GPLRP2 and DolmI PLA1 to hydrolyze polar lipids, such as phospholipids. In conclusion, the beta5 loop, the beta9 loop, and the lid domain play an essential role in substrate selectivity towards triglycerides, phospholipids and galactolipids.

CT Check Tags: Animal; Human
Amino Acid Sequence
Hydrolysis
Kinetics
*Lipase: CH, chemistry
Lipase: GE, genetics
Lipase: ME, metabolism
Molecular Sequence Data
***Pancreas: EN, enzymology**
Substrate Specificity

CN EC 3.1.1.3 (Lipase)

L64 ANSWER 6 OF 16 MEDLINE
AN 1998386726 MEDLINE
DN 98386726 PubMed ID: 9720257
TI Combined **lipase** deficiency (cld/cld) in mice affects differently post-translational processing of lipoprotein **lipase**, hepatic **lipase** and **pancreatic lipase**.
AU Scow R O; Schultz C J; Park J W; Blanchette-Mackie E J
CS Laboratory of Cellular and Developmental Biology, National Institute of Diabetes and Digestive and Kidney Diseases, National Institute of Health, Bethesda, MD 20892, USA.. rs1j@nih.gov
SO CHEMISTRY AND PHYSICS OF LIPIDS, (1998 Jun) 93 (1-2) 149-55. Ref: 47
Journal code: CZW; 0067206. ISSN: 0009-3084.
CY Ireland
DT Journal; Article; (JOURNAL ARTICLE)
General Review; (REVIEW)
(REVIEW, TUTORIAL)
LA English
FS Priority Journals
EM 199809
ED Entered STN: 19981006
Last Updated on STN: 19981006
Entered Medline: 19980918
AB Lipoprotein **lipase** (LPL) and hepatic **lipase** (HL), which act on plasma lipoproteins, belong to the same gene family as **pancreatic lipase**. LPL is synthesized in heart, muscle and adipose tissue, while HL is synthesized primarily in liver. LPL is also synthesized in liver of newborn rodents. The active form of LPL is a dimer, whereas that of HL has not been established. Combined **lipase** deficiency (CLD) is an autosomal recessive mutation (cld) in mice which impairs post-translational processing of LPL and HL. Cld/cld mice have very low LPL and HL activities (< 5% of normal), yet normal **pancreatic lipase** activity. They develop massive hypertriglyceridemia and die within 3 days after birth. The CLD mutation allows synthesis, glycosylation and dimerization of LPL, but blocks activation and secretion of the **lipase**. Thus, dimerization per se does not result in production of active LPL. Immunofluorescence studies showed that LPL is retained in endoplasmic reticulum (ER) in cld/cld cells. Translocation of Golgi components to ER by treatment with brefeldin A (BFA) enabled synthesis of active LPL in cultured cld/cld brown adipocytes. Thus, production of inactive LPL in cld/cld cells results from inability of the cells to transport LPL from ER. The CLD mutation allows synthesis and glycosylation of HL, but blocks activation of the **lipase**. Immunofluorescence studies located HL mostly outside of cells in liver, liver cell cultures and incubated adrenal tissue of normal and cld/cld mice and mostly inside of cells in liver cell cultures and adrenal tissues treated with monensin (to block secretion of protein). These findings demonstrate synthesis and secretion of HL by both liver and

adrenal cells of normal and cld/cld mice. Thus, the CLD mutation allows secretion of inactive HL by liver and adrenals. However, it does not block synthesis or secretion of active **pancreatic lipase.**
Our findings indicate that LPL, HL and **pancreatic lipase**, although closely related, are processed differently.

CT Check Tags: Animal
*Lipase: DF, deficiency
*Lipase: ME, metabolism
*Lipoprotein Lipase: ME, metabolism
*Liver: EN, enzymology
Mice
***Pancreas: EN, enzymology**
*Protein Processing, Post-Translational

CN EC 3.1.1.3 (Lipase); EC 3.1.1.34 (Lipoprotein Lipase)

L64 ANSWER 7 OF 16 MEDLINE
AN 97382932 MEDLINE
DN 97382932 PubMed ID: 9240923
TI Structure and function of **pancreatic lipase** and colipase.
AU Lowe M E
CS Washington University School of Medicine, Department of Pediatrics, St. Louis, Missouri 63110, USA.. Lowe@KidsA1.wustl.edu
SO ANNUAL REVIEW OF NUTRITION, (1997) 17 141-58. Ref: 74
Journal code: ARN; 8209988. ISSN: 0199-9885.
CY United States
DT Journal; Article; (JOURNAL ARTICLE)
General Review; (REVIEW)
(REVIEW, TUTORIAL)
LA English
FS Priority Journals
EM 199709
ED Entered STN: 19971008
Last Updated on STN: 19971008
Entered Medline: 19970919
AB Dietary fats are essential for life and good health. Efficient absorption of dietary fats is dependent on the action of **pancreatic** triglyceride **lipase**. In the last few years, large advances have been made in describing the structure and lipolytic mechanism of human **pancreatic** triglyceride **lipase** and of colipase, another **pancreatic** protein that interacts with **pancreatic** triglyceride **lipase** and that is required for **lipase** activity in the duodenum. This review discusses the advances made in protein structure and in understanding the relationships of structure to function of **pancreatic** triglyceride **lipase** and colipase.
CT Check Tags: Human
Binding Sites
*Colipases: CH, chemistry
*Colipases: ME, metabolism
*Lipase: CH, chemistry
*Lipase: ME, metabolism
Molecular Structure
***Pancreas: EN, enzymology**
Structure-Activity Relationship
CN 0 (Colipases); EC 3.1.1.3 (Lipase)

L64 ANSWER 8 OF 16 MEDLINE
AN 97263689 MEDLINE
DN 97263689 PubMed ID: 9109604
TI Molecular mechanisms of rat and human **pancreatic** triglyceride **lipases.**
AU Lowe M E
CS Department of Pediatrics, Washington University School of Medicine, St. Louis, MO 63110, USA.
NC DK33487 (NIDDK)

HD/DK33060 (NICHD)
SO JOURNAL OF NUTRITION, (1997 Apr) 127 (4) 549-57. Ref: 49
Journal code: JEV; 0404243. ISSN: 0022-3166.
CY United States
DT Journal; Article; (JOURNAL ARTICLE)
General Review; (REVIEW)
(REVIEW, TUTORIAL)
LA English
FS Priority Journals
EM 199705
ED Entered STN: 19970523
Last Updated on STN: 19970523
Entered Medline: 19970515
AB Dietary fats affect health and disease. The assimilation of dietary fats into the body requires that they be digested by **lipases**. One **lipase, pancreatic** triglyceride **lipase**, is essential for the efficient digestion of dietary fats. **Pancreatic** triglyceride **lipase** is the archetype of the **lipase** gene family that includes two homologues of **pancreatic** triglyceride **lipase, pancreatic lipase** -related proteins 1 and 2. In recent years, important advances have been made in delineating the mechanisms of lipolysis. The cDNA sequences encoding **pancreatic** triglyceride **lipase** and the related proteins have been described. The tertiary structure of human **pancreatic** triglyceride **lipase** has been determined alone and in a complex with colipase, a **pancreatic** protein required for **lipase** activity in the duodenum. This structural information has allowed the rational design of site-specific mutants of **pancreatic** triglyceride **lipase**. Together with the structural information, these mutants have greatly advanced our understanding of the molecular details governing lipolysis. This review describes these studies, which will eventually provide the background for the rational design of nutrition therapy in patients with **pancreatic** insufficiency and fat malabsorption.
CT Check Tags: Animal; Human; Support, U.S. Gov't, P.H.S.
Amino Acid Sequence
*Colipases: PH, physiology
*Dietary Fats: ME, metabolism
*Digestion: PH, physiology
Lipase: CH, chemistry
*Lipase: GE, genetics
*Lipase: PH, physiology
Lipolysis
Molecular Sequence Data
Protein Structure, Tertiary
Rats
Substrate Specificity
CN 0 (Colipases); 0 (Dietary Fats); EC 3.1.1.3 (Lipase)

L64 ANSWER 9 OF 16 MEDLINE
AN 96014380 MEDLINE
DN 96014380 PubMed ID: 7579978
TI **Lipase** structures at the interface between chemistry and biochemistry.
AU Carriere F; Verger R; Lookene A; Olivecrona G
CS Laboratoire de Lipolyse Enzymatique, CNRS, Marseille, France.
SO EXS, (1995) 73 3-26. Ref: 96
Journal code: BFZ; 9204529.
CY Switzerland
DT Journal; Article; (JOURNAL ARTICLE)
General Review; (REVIEW)
(REVIEW, TUTORIAL)
LA English
FS Priority Journals
EM 199512
ED Entered STN: 19960124

Last Updated on STN: 19970203
Entered Medline: 19951206

AB In this chapter we review recent molecular knowledge on two structurally related mammalian triglyceride **lipases** which have evolved from a common ancestral gene. The common property of the **lipase** family members is that they interact with non-polar substances. **Pancreatic lipase** hydrolyzes triglycerides in the small intestine in the presence of many dietary components, other digestive enzymes and high concentrations of detergents (bile salts). Lipoprotein **lipase** acts at the vascular side of the blood vessels where it hydrolyses triglycerides and some phospholipids of the circulating plasma lipoproteins. A third member of the gene family, hepatic **lipase**, is found in the liver of mammals. Also, this **lipase** is involved in lipoprotein metabolism. The three **lipases** are distantly related to some non-catalytic yolk proteins from Drosophila (Persson et al., 1989; Kirchgessner et al., 1989; Hide et al., 1992) and to a phospholipase A1 from hornet venom (Soldatova et al., 1993).

CT Check Tags: Animal; Human; Support, Non-U.S. Gov't
Amino Acid Sequence
Binding Sites
Enzyme Activation
Kinetics
Lipase: CH, chemistry
Lipase: GE, genetics
*Lipase: ME, metabolism
Lipoprotein Lipase: CH, chemistry
*Lipoprotein Lipase: ME, metabolism
Liver: EN, enzymology
Molecular Sequence Data
Pancreas: EN, enzymology
Protein Conformation
Structure-Activity Relationship
Triglycerides: ME, metabolism

CN 0 (Triglycerides); EC 3.1.1.3 (Lipase); EC 3.1.1.34 (Lipoprotein Lipase)

L64 ANSWER 10 OF 16 MEDLINE
AN 95054807 MEDLINE
DN 95054807 PubMed ID: 7965454
TI Human milk bile salt-stimulated **lipase**: functional and molecular aspects.
AU Hernell O; Blackberg L
CS Department of Pediatrics, University of Umea, Sweden.
SO JOURNAL OF PEDIATRICS, (1994 Nov) 125 (5 Pt 2) S56-61. Ref: 38
Journal code: JLZ; 0375410. ISSN: 0022-3476.
CY United States
DT Journal; Article; (JOURNAL ARTICLE)
General Review; (REVIEW)
(REVIEW, TUTORIAL)
LA English
FS Abridged Index Medicus Journals; Priority Journals
EM 199412
ED Entered STN: 19950110
Last Updated on STN: 19950110
Entered Medline: 19941207

AB In breast-fed infants, digestion of milk triglycerides, the major source of energy and long-chain polyunsaturated fatty acids, is catalyzed by a concerted action of gastric **lipase**, colipase-dependent **pancreatic lipase**, and bile salt-stimulated **lipase** (BSSL). The major part of BSSL is present in the milk and the lesser part originates in the infant's exocrine **pancreas**. Gastric **lipase** is important in initiating digestion of milk fat globule triglycerides in the stomach. BSSL shifts the final products of triglyceride digestion from monoglyceride and free fatty acid (the products of colipase-dependent **pancreatic lipase**) to glycerol and free fatty acid, which may promote efficient absorption. Moreover, BSSL is likely to promote efficient use of milk cholesteryl- and

fat-soluble vitaminesters and long-chain polyunsaturated fatty acids (> C18). The cDNA sequence has shown that BSSL has a unique primary structure. The N-terminal half is highly conserved between species and shows striking homology to typical esterases, for example, acetylcholine esterase. In contrast, the C-terminal half, containing 16 proline-rich repeats of 11 amino acid residues, is unique to BSSL. Using several recombinant variants of BSSL, we have found that these unique repeats and the glycosylation are completely dispensable for activity. Thus all typical properties of BSSL reside in the N-terminal half of the molecule.

CT Check Tags: Animal; Human; Support, Non-U.S. Gov't
Animals, Newborn
*Breast Feeding
DNA, Complementary: AN, analysis
*Fatty Acids, Unsaturated: ME, metabolism
Infant
*Infant Nutrition
Infant, Newborn
Intestinal Absorption
Lipase: AN, analysis
Lipase: GE, genetics
*Lipase: ME, metabolism
*Milk, Human: CH, chemistry
Molecular Structure
***Pancreas: ME, metabolism**
*Stomach: ME, metabolism
*Triglycerides: ME, metabolism

CN 0 (DNA, Complementary); 0 (Fatty Acids, Unsaturated); 0 (Triglycerides); EC 3.1.1.- (bile salt-stimulated lipase); EC 3.1.1.3 (Lipase)

L64 ANSWER 11 OF 16 MEDLINE
AN 93251639 MEDLINE
DN 93251639 PubMed ID: 8485865
TI **Lipase** in serum--the elusive enzyme: an overview.
AU Tietz N W; Shuey D F
CS Department of Pathology and Laboratory Medicine, University of Kentucky Medical Center, Lexington 40536.
SO CLINICAL CHEMISTRY, (1993 May) 39 (5) 746-56. Ref: 114
Journal code: DBZ; 9421549. ISSN: 0009-9147.
CY United States
DT Journal; Article; (JOURNAL ARTICLE)
General Review; (REVIEW)
(REVIEW, TUTORIAL)
LA English
FS Priority Journals
EM 199306
ED Entered STN: 19930618
Last Updated on STN: 19930618
Entered Medline: 19930610

AB **Lipase** is a glycoprotein with 420-449 amino acid residues and a M(r) of 46,000-56,000 for **pancreatic lipase** and 32,000-39,000 for serum **lipase**. **Lipase** is present in the **pancreas**, intestines, and a variety of other tissues. The concentration gradient between **pancreatic** tissue and serum **lipase** is approximately 20,000-fold. Serine, as part of an Asp-His-Ser triad, is the nucleophilic residue essential for catalysis. **Lipase** differs from other esterases by the presence of a hydrophobic recognition site. The optimal pH is between 7.5 and 10.0, depending on the reaction condition; the pI for the various forms of the enzyme has been reported as 5.80 and 5.85; 6.4, 6.8, and 7.0; and 7.4 for a purified fraction. Several authors report the presence of two molecular forms in the **pancreas** and three electrophoretic bands with lipolytic activity. In normal serum two bands have been observed; in **pancreatitis** as many as four bands have been seen. Lipolytic activity may not always be due to **lipase**. Assays specific for **lipase** require a triglyceride as substrate as well as the presence of colipase (a water-soluble and heat-stable protein, essential for

lipase action), a secondary bile salt, and Ca2+. The clinical sensitivity of all modern assays is high because of selection of a low decision limit; the clinical specificity varies greatly but can be improved by increasing the cutoff point. **Lipase** determinations in **pancreatitis** are superior to amylase determinations. The reasons for the great variability of reports regarding the clinical utility of **lipase** are discussed, and the clinical utility of **lipase** determinations is summarized.

CT Check Tags: Human
Chemistry, Physical
Enzyme Activation
Lipase: AI, antagonists & inhibitors
*Lipase: BL, blood
Lipase: CH, chemistry
Pancreatitis: EN, enzymology

CN EC 3.1.1.3 (Lipase)

L64 ANSWER 12 OF 16 MEDLINE
AN 92199880 MEDLINE
DN 92199880 PubMed ID: 2134569
TI Lingual and gastric **lipases.**
AU Hamosh M
CS Department of Pediatrics, Georgetown University Medical Center, Washington, DC 20007.
NC HD 10823 (NICHD)
SO NUTRITION, (1990 Nov-Dec) 6 (6) 421-8. Ref: 121
Journal code: BEU; 8802712. ISSN: 0899-9007.
CY United States
DT Journal; Article; (JOURNAL ARTICLE)
General Review; (REVIEW)
(REVIEW, ACADEMIC)
LA English
FS Priority Journals
EM 199204
ED Entered STN: 19920509
Last Updated on STN: 19970203
Entered Medline: 19920430

AB The 1973 discovery of lingual **lipase**, which is secreted by lingual serous glands and hydrolyzes medium- and long-chain triglycerides in the stomach, has renewed interest in the gastric phase of fat digestion. In humans, **lipase** is present in the serous (von Ebner) glands of the tongue, where it is localized in zymogen granules. In the stomach, the highest **lipase** activity is in the body. By immunocytochemistry, gastric **lipase** is confined to the chief cells of the fundic mucosa and is colocalized with pepsin. Human **lipase** purified from lingual serous glands or gastric juice has a MW of 45k to 51K but tends to aggregate (MW 270-300K and 500K) and is highly hydrophobic. Secretion of gastric **lipase** appears to be stimulated by at least two receptor mechanisms. It has been suggested that the products of gastric lipolysis maintain the sterility of the gastrointestinal tract. These enzymes are essential for the digestion of milk fat in the newborn because, contrary to other digestive **lipases** (**pancreatic** or milk digestive **lipase**), lingual and gastric **lipases** can penetrate into the milk fat globule and initiate the digestive process. Lingual and gastric **lipase** activity has been found in subjects with cystic fibrosis and appears to continue in the upper small intestine in these patients, perhaps replacing some of the missing **pancreatic lipase** . It is possible that lingual and gastric **lipase** supplements would be more effective in preventing steatorrhea in these patients than are the **pancreatic** enzyme supplements now given. The same therapeutic utility might be obtained in patients with alcoholic **pancreatic** insufficiency.

CT Check Tags: Animal; Human; Support, U.S. Gov't, P.H.S.
Alcoholism: EN, enzymology
Amino Acid Sequence

Cystic Fibrosis: EN, enzymology
Dietary Fats: ME, metabolism
Gastric Mucosa: EN, enzymology
Lipase: CH, chemistry
*Lipase: PH, physiology
Molecular Sequence Data
Pancreas: EN, enzymology
Tongue: EN, enzymology
CN 0 (Dietary Fats); EC 3.1.1.3 (Lipase)

L64 ANSWER 13 OF 16 MEDLINE
AN 89150317 MEDLINE
DN 89150317 PubMed ID: 3147716
TI Catalytic activity and association of **pancreatic lipase**
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AU Antonov V K; Dyakov V L; Mishin A A; Rotanova T V
CS Shemyakin Institute of Bioorganic Chemistry, USSR Academy of Sciences, Moscow.
SO BIOCHIMIE, (1988 Sep) 70 (9) 1235-44. Ref: 27
Journal code: A14; 1264604. ISSN: 0300-9084.
CY France
DT Journal; Article; (JOURNAL ARTICLE)
General Review; (REVIEW)
(REVIEW, TUTORIAL)
LA English
FS Priority Journals
EM 198904
ED Entered STN: 19900306
Last Updated on STN: 19970203
Entered Medline: 19890417
AB The authors summarize their work concerning the mechanism of **pancreatic lipase** activation. The activation of **lipase** by submicellar SDS concentrations was found to imitate closely enough its activation by an interface. **Lipase** activation was shown to be caused by changes in the rate constants for substrate chemical transformation and to involve conformational changes of the enzyme and its association. The complex of a conformationally modified **lipase** with the detergent, which acts as a 'structure-forming' agent, is associated with native **lipase** molecules setting up their active site. The mechanism of **lipase** activation at an interface both in vitro and in vivo is discussed.
CT Catalysis
Copper: ME, metabolism
Enzyme Activation
Hydrolysis
Kinetics
Lipase: AI, antagonists & inhibitors
*Lipase: ME, metabolism
***Pancreas: EN, enzymology**
Sodium Dodecyl Sulfate
RN 151-21-3 (Sodium Dodecyl Sulfate); 7440-50-8 (Copper)
CN EC 3.1.1.3 (Lipase)

L64 ANSWER 14 OF 16 MEDLINE
AN 89150316 MEDLINE
DN 89150316 PubMed ID: 3147715
TI Minireview on **pancreatic lipase** and colipase.
AU Chapus C; Rovery M; Sarda L; Verger R
CS Centre de Biochimie et de Biologie Moleculaire du Centre National de la Recherche Scientifique, Marseille, France.
SO BIOCHIMIE, (1988 Sep) 70 (9) 1223-34. Ref: 84
Journal code: A14; 1264604. ISSN: 0300-9084.
CY France
DT Journal; Article; (JOURNAL ARTICLE)
General Review; (REVIEW)
(REVIEW, TUTORIAL)

LA English
FS Priority Journals
EM 198904
ED Entered STN: 19900306
Last Updated on STN: 19900306
Entered Medline: 19890417
AB By hydrolyzing the dietary triacylglycerols, **pancreatic lipase** causes catalysis in heterogeneous medium. In vivo, **lipase** action cannot take place without colipase due to the presence of bile salts. The cofactor enables **lipase** anchoring to the water-lipid interface. The **lipase**-colipase system furnishes an excellent example of specific interactions (protein-protein and protein-lipid). The studies of **lipase** catalytic properties brought to light the importance of certain parameters related to the 'quality of the interface'. The structure-function relationship analyses revealed a certain number of functional amino acid residues in **lipase** and colipase involved either in the catalytic site of the enzyme or in the recognition sites (**lipase**-colipase and protein-interface). Comparisons of the sequences of **lipases** derived from different sources display interesting similarities in certain cases.
CT Check Tags: Animal; Human
Amino Acid Sequence
Cattle
*Colipases: ME, metabolism
Dogs
Hydrolysis
*Lipase: ME, metabolism
Mice
Molecular Sequence Data
***Pancreas: EN, enzymology**
*Proteins: ME, metabolism
Rats
Swine
CN 0 (Colipases); 0 (Proteins); EC 3.1.1.3 (Lipase)

L64 ANSWER 15 OF 16 MEDLINE
AN 77141342 MEDLINE
DN 77141342 PubMed ID: 321489
TI Pregastric esterase and other oral **lipases**--a review.
AU Nelson J H; Jensen R G; Pitas R E
SO JOURNAL OF DAIRY SCIENCE, (1977 Mar) 60 (3) 327-62. Ref: 136
Journal code: HWV; 2985126R. ISSN: 0022-0302.
CY United States
DT Journal; Article; (JOURNAL ARTICLE)
General Review; (REVIEW)
LA English
FS Priority Journals
EM 197705
ED Entered STN: 19900313
Last Updated on STN: 19900313
Entered Medline: 19770520
AB The secretion of pregastric esterase and other oral **lipases** has been detected in 13 species. Research on secretion by the human, calf, kid goat, lamb, and rat of pregastric esterase has been significant. Secretion by calves is little affected by age or diet but is greater when calves are nipple fed than when pail fed. Whole milk sham-fed to calves exhibits immediate, sharp decreases in pH and rennet coagulation time resulting from liberation of free fatty acids by pregastric esterase. Bacterial counts in sham-fed products are higher than in control (nonfed) products, but during subsequent incubation bacterial numbers increase less rapidly in sham-fed products. Calf pregastric esterase is a major fat digestive enzyme in young calves but gradually becomes subsidiary to **pancreatic lipase** as secretion of the latter develops with age. Calf, kid goat, and lamb pregastric esterase exhibits optimum activity on milk fat but is capable of splitting other dietary fats. Data

on oral and "gastric" **lipases** in calves, humans, and rats suggests that gastric **lipase** is oral **lipase**. Data on pH and temperature optima as well as activation and inhibition of oral **lipases** is contradictory but appears to vary considerably between species. Calf pregastric esterase exhibits a unique specificity for fatty acids 4:0 to 10:0 and preferentially hydrolyzes the primary ester position of glycerin. Preparations of calf, kid goat, and lamb pregastric esterase are used commercially to impar typical flavors to Italian-type and Feta cheeses and to accelerate flavor development in other cheeses and cheese-like products. Butterfat modified by pregastric esterase is utilized to impart dairy flavor character to a wide range of processed foods. Treatment with pregastric esterase of calf scours and human malabsorption of syndrome also has been reported.

CT Check Tags: Animal; Comparative Study; Human
Abomasum: ME, metabolism
Cattle
Cheese
Diet
Esterases: IP, isolation & purification
*Esterases: ME, metabolism
Esterases: SE, secretion
Fatty Acids, Nonesterified: ME, metabolism
Goats
Lipase: IP, isolation & purification
*Lipase: ME, metabolism
Lipase: SE, secretion
Milk: ME, metabolism
*Mouth: EN, enzymology
Pancreas: SE, secretion
Pharynx: EN, enzymology
Rats
Saliva: EN, enzymology
Salivary Glands: EN, enzymology
Sheep
Stomach: SE, secretion
Tongue: EN, enzymology

CN 0 (Fatty Acids, Nonesterified); EC 3.1. (Esterases); EC 3.1.1.3 (Lipase)

L64 ANSWER 16 OF 16 MEDLINE
AN 76211875 MEDLINE
DN 76211875 PubMed ID: 776772
TI **Pancreatic lipase** and colipase: an example of heterogeneous biocatalysis.
AU Semeriva M; Desnuelle P
SO HORIZONS IN BIOCHEMISTRY AND BIOPHYSICS, (1976) 2 32-59. Ref: 39
Journal code: GB5; 7502793. ISSN: 0096-2708.
CY ENGLAND: United Kingdom
DT Journal; Article; (JOURNAL ARTICLE)
General Review; (REVIEW)
LA English
FS Priority Journals
EM 197609
ED Entered STN: 19900313
Last Updated on STN: 19970203
Entered Medline: 19760901
AB The hydrolytic reactions catalyzed by **pancreatic lipase** represent a good example of heterogeneous catalysis. The particularity of this enzyme is provided by its preferential action on emulsified substrates. The first step of catalysis resides in a reversible adsorption of the enzyme to the oil-water interface. In fact, the formation of this adsorption complex is an obligatory step for the enzyme to display its full activity. Two principal but not necessarily exclusive hypotheses have been proposed to explain the observed interfacial activation: Either the interface confers new properties on the substrate which allow its subsequent hydrolysis, or the enzyme itself is modified by adsorption at the interface. Different approaches have recently been developed to

clarify this point further. The results obtained by chemical modifications of **lipase** are consistent with the following hypothesis. The active site preexists in solution and becomes fully functional only by interaction of the interface with an additional site on the enzyme molecule which can be tentatively called the "interfacial activation site." Finally, a protein of low molecular weight, colipase, seems necessary for **lipase** to express its activity under physiological conditions. This protein enters specific interactions with bile salts micelles and is responsible for the reversal of the inhibition of lipolysis brought about by these detergents.

CT Check Tags: Animal
Binding Sites
Carbodiimides: PD, pharmacology
*Colipases: PD, pharmacology
Esterases: ME, metabolism
Kinetics
*Lipase: ME, metabolism
Liver: EN, enzymology
Micelles
Pancreas: DE, drug effects
***Pancreas: EN, enzymology**
Protein Binding
*Proteins: PD, pharmacology
Structure-Activity Relationship

CN 0 (Carbodiimides); 0 (Colipases); 0 (Proteins); EC 3.1. (Esterases); EC 3.1.1.3 (Lipase)